OCTOBER 22, 1960
VOL. 159 — NO. 17

Telephony®

THE JOURNAL OF THE TELEPHONE INDUSTRY

TWO DECADES OF SERVICE

C. C. Pearce (right), new president of the United States Independent Telephone Association, presenting certificate of appreciation to Clyde S. Bailey, executive vice president, in recognition of 20 years' service to the organization.

Guaranteed Circulation This Issue
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USITA CONVENTION REPORT

MANAGEMENT • PLANT • TRAFFIC • COMMERCIAL • LEGAL • ACCOUNTING

Who said Stromberg-Carlson can't give you P.P.C.S.*?

We'll give you a quotation on it right now!

"Well," you might ask, "what'll it do to my present toll ticketing system?"

No problem—if you have XY® Toll Ticketing. Just add P.P.C.S. It's that simple. Nothing more than minor additions needed.

So—if the economics of your business calls for the ultimate, it's yours from Stromberg-Carlson. No obsolescence of your present XY Toll Accounting system. Your investment is protected.

And remember this: XY Toll Ticketing equipment, with magnetic tape recorder, is more versatile, more economical than competitive gear. You get direct readout into punched cards, punched tape, automatic typewriter.

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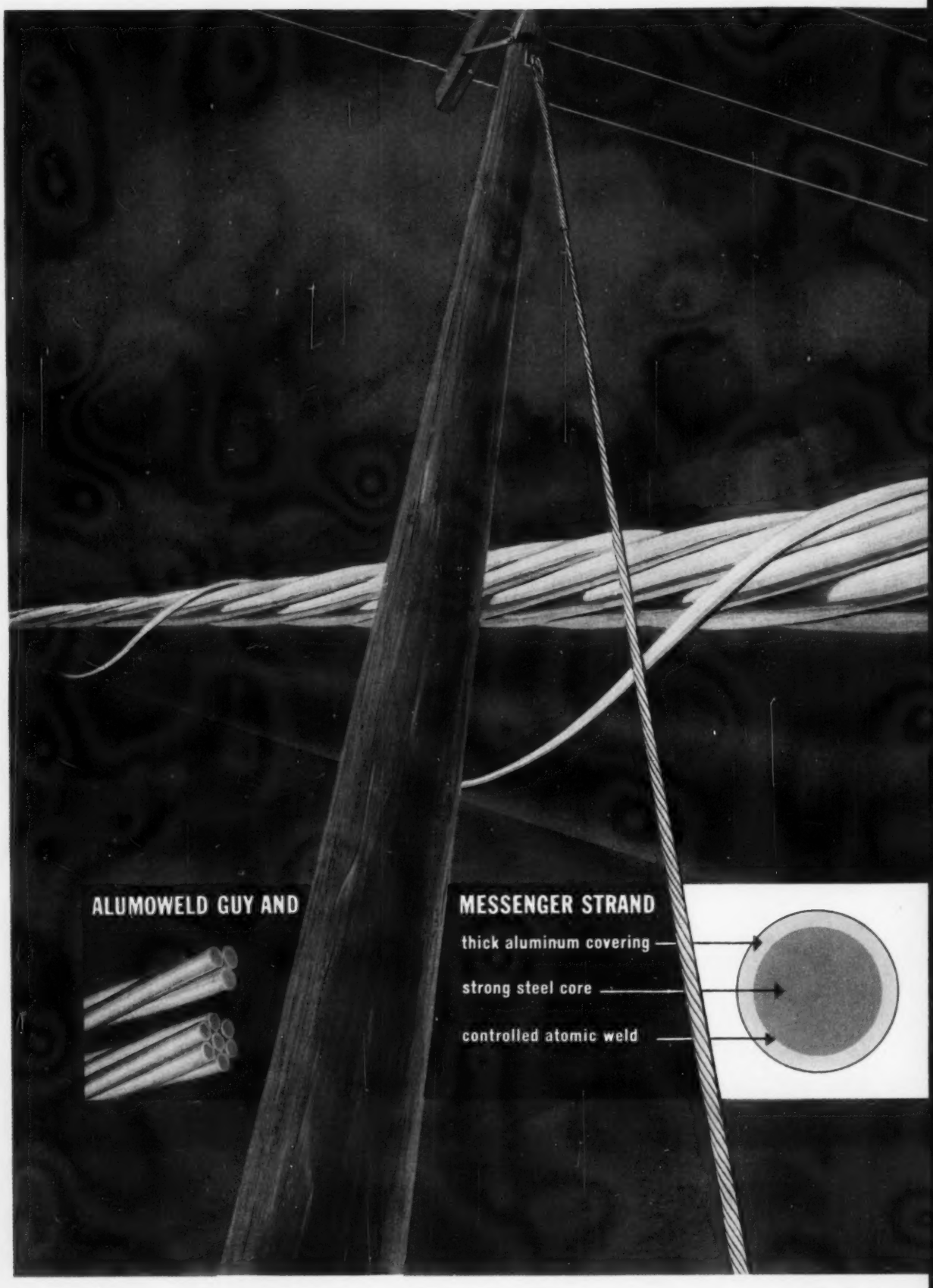
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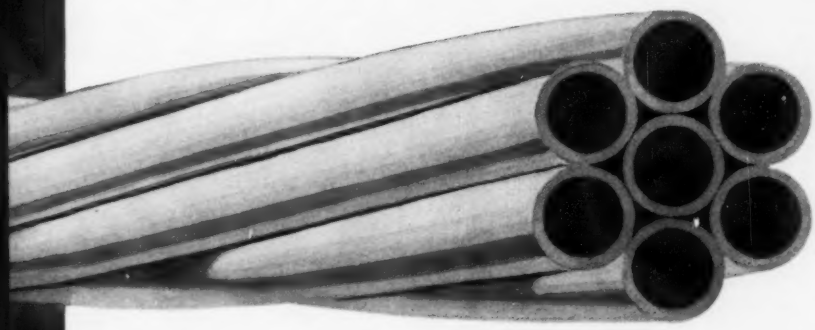
MESSENGER STRAND
thick aluminum covering
strong steel core
controlled atomic weld

Are you taking advantage of ALUMOWELD STRAND for guys and messengers?



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Since Alumoweld will not rust or corrode, its high strength is permanent. Costly maintenance is eliminated because Alumoweld Guys and Messengers stay up for the life of the installations they support.

Alumoweld is the only strand made with wires having a *thick* aluminum covering—25% by area. And the aluminum cannot crack, flake or peel . . . it is interlocked with the steel core by a ductile weld that is permanent under all operating conditions.

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It's easy to see that Alumoweld offers economies you can't afford to pass up. Put this light-weight, high-strength strand on your lines and prove it for yourself. Write today for Engineering Bulletin E.D. 3000.

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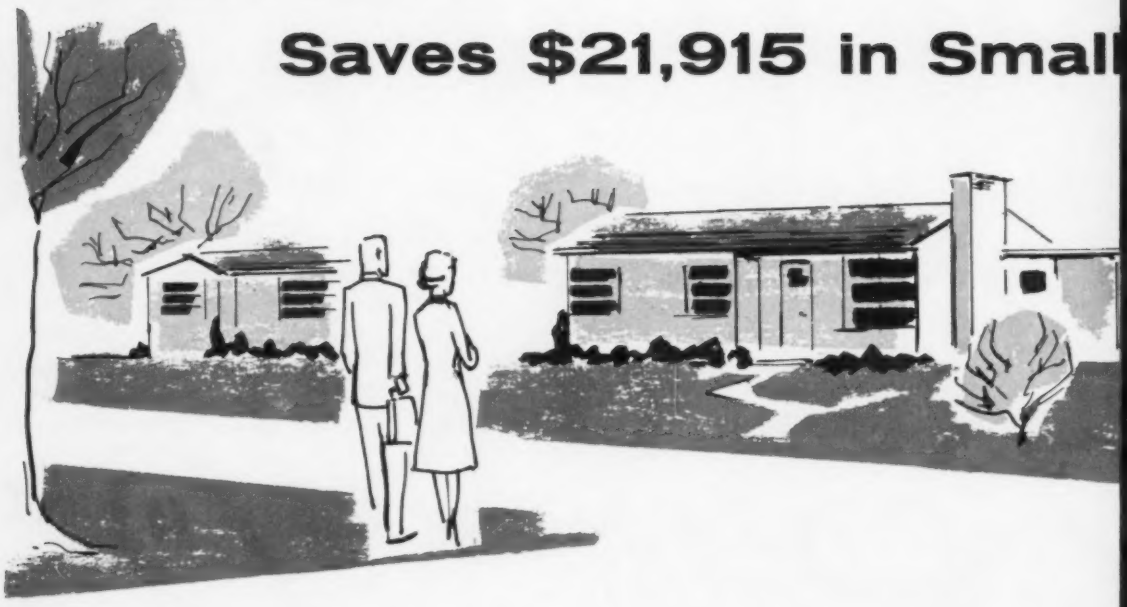
LEICH

LINE CONCENTRATOR

PROFITABLE USES

Saves $21,915 in Small



Imagine! A unit that saved $21,915 while serving a small growing community.

That's exactly what Leich's Line Concentrator did by cutting outside plant costs. Instead of serving each line over a separate wire pair, it concentrates a number of subscriber lines over a much smaller "high usage" trunk group.

The cost-cutting story: This small community was fed over a 26 pair cable which was working at 100 per cent capacity. There was an immediate need for 8 more lines with a projected 15 year ultimate of 10 more lines for a total of 18. Six of the existing lines and 7 of the new lines required long line adapters.

The cost estimate for an additional 26 pair, 19 gauge cable plus loading was $30,000.

The cost of the Line Concentrator plus weatherproof cabinet and installation labor was $4,785. In addition, it was necessary to move the distribution point of the Concentrator's subscriber unit back toward the central office to get within trunk limits for Concentrator operation. The cost was an additional $3,700 for a total of $8,485.

This figure was reduced to a net cost of $8,085 by applying long line adapters to the 9 Concentrator trunks rather than 13 long lines.

Savings from use of the Concentrator: $21,915!

LEICH

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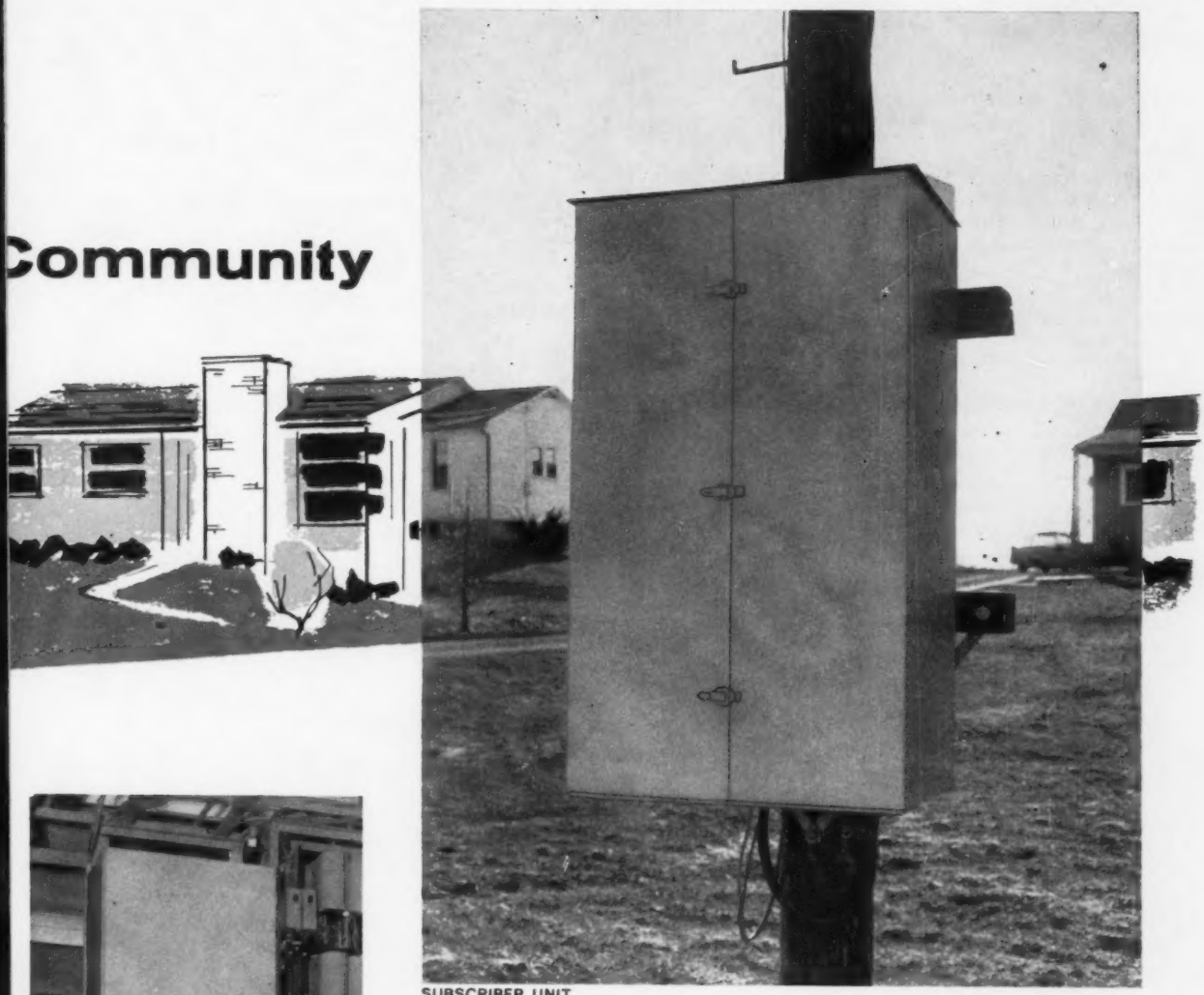
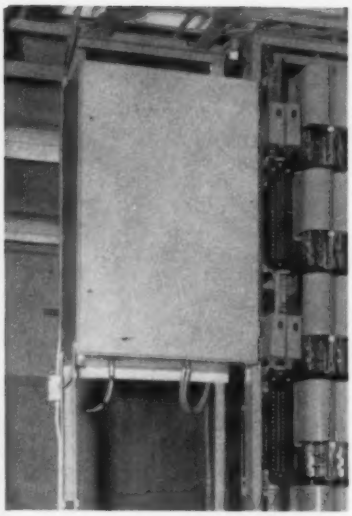
Community



SUBSCRIBER UNIT



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manufacturers of telephones, switchboards and related apparatus since 1907

FLASHES AND PLUGS

CALL BY HUNGER. In Calgary, Alberta, Canada, when a telephone subscriber dials CHICKEN on his telephone he can get a chicken!

Barney Gelfand, owner-manager of Barney's Fine Foods, claims Calgary is the only place in the world where it can happen.

When Barney's take-out order department was opened in 1958 and a telephone number was assigned, nothing out of the ordinary was seen.

Two weeks later, when Mr. Gelfand broke the news that CHerry 4-2536 spells CHICKEN, the telephone rang constantly with people saying "It works!" then placing orders. Sales boomed.

•

ASTRONAUT TRAINING. A young housewife had just put a load of towels into her drier when the telephone rang. She picked up the call on her laundry extension.

While talking, she noticed that there was something peculiar in the last batch of laundry. She had only white towels and yet there was something jet black whirling around and around in the drier.

She quickly finished her call, stopped the drier, and emptied it. There, amidst the towels, was the family cat, angry, hot and dizzy but apparently none the worse for its ride.

If the lady had had to go upstairs to answer the call, this story would have had a different ending.

Even with nine lives, it's doubtful if any cat could stand a lengthy trip in such an overheated merry-go-round.

It's a reason for having a laundry extension which we're sure not many people have considered.

•

CALL TO THE WILD. "Will you ring my telephone, please?" a subscriber asked Mrs. Lorraine Moody, Southwestern Bell Telephone Co. operator at Waco, Tex.

"My dog is outside and won't come in when I call him—but he always comes running when he hears the telephone ring."

Mrs. Moody let the telephone ring about 10 times before the customer lifted the receiver. Above a dog's barking, she said: "Thanks a lot, operator, that did it. He's home now."

•

OTHER SIDE OF THE SCALE. Pet Milk magazine reported that a man fond of playing practical jokes sent a collect telegram to his friend which when read over the telephone said: "I am perfectly well."

A week later the joker received a heavy package on which he had to pay sizable express charges. Inside was a large stone with a note attached to it.

The note read: "This is the weight your telegram lifted from my mind."

CHANGE OF ADDRESS

Please notify your local postmaster and the Circulation Department of TELEPHONY of change of address. Change cannot be made without the old as well as the new address. Allow three weeks for change of address to become effective.

Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY
Since 1901

October 22, 1960

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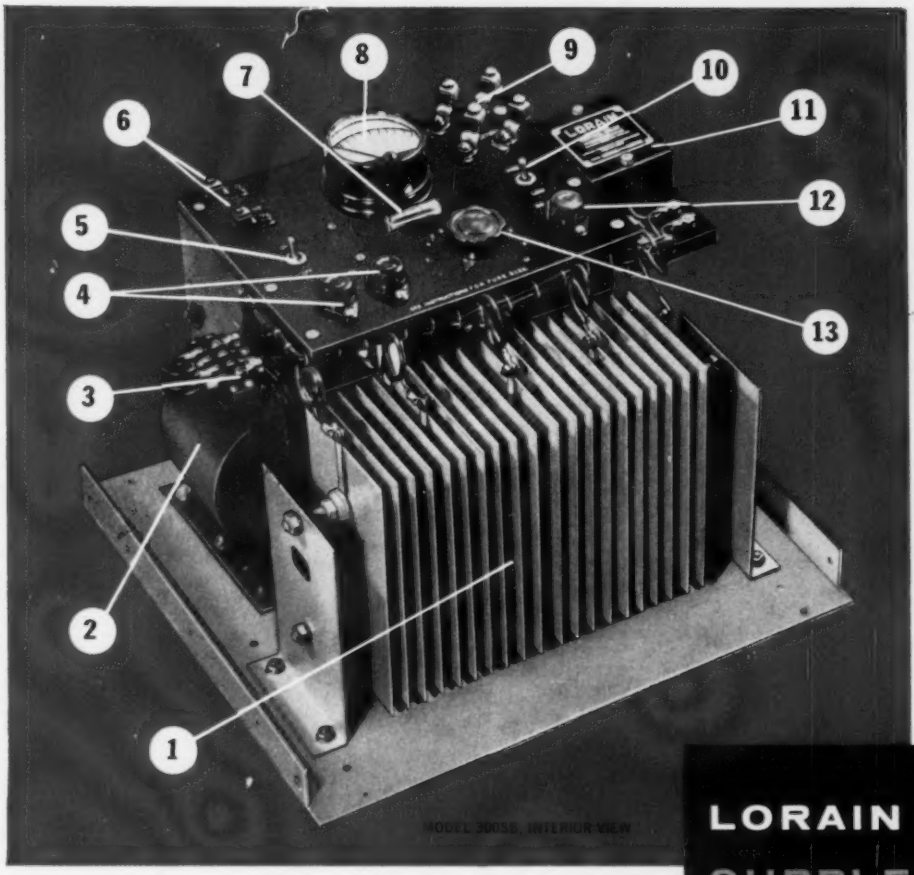


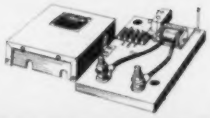
1. Selenium rectifier
2. Isolating transformer
3. Taps to adjust for A-C line voltage
4. A-C line fuses
5. On-off switch
6. A-C input terminals
7. Neon lamp to indicate tripping of overload relay
8. Output ammeter
9. D-C connections
10. Output range selector switch
11. Control relay, type FS1R
12. D-C load fuse
13. Tap switch

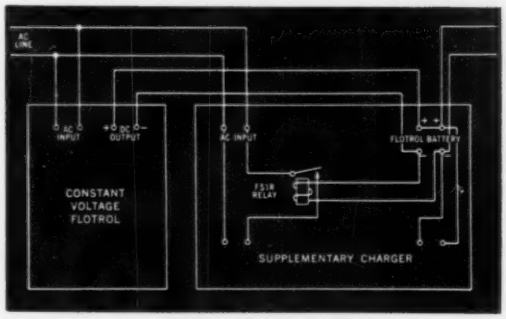
LORAIN FLOTROL SUPPLEMENTARY CHARGERS

For peak loads and growing plants . . . save money with "a Flotrol and a half"

Here is the low-cost answer to expanding loads that are taxing the capacity of your charger. A Lorain Supplementary Charger matched to your Flotrol as much as doubles its capacity at a fraction of the cost of a larger Flotrol. It is also used in new installations to get an "in-between-size" Flotrol and avoid paying for un-needed capacity. The Supplementary Unit delivers a constant current which is adjustable by a tap switch. Controlled by the master Flotrol, it provides a closely regulated output voltage. A control relay shuts the unit off when it is not needed. Proved in service since 1950. Thousands in use. Seven models, with output from 3 to 24 amps., 45-56 and 25 volts. Rack or wall mount. Write for Bulletin 171A.

FS1R Control Relay is mounted inside the unit and is wired as below. Externally mounted control relays (see right) are offered to simplify heavy wiring for the larger Flotrols.





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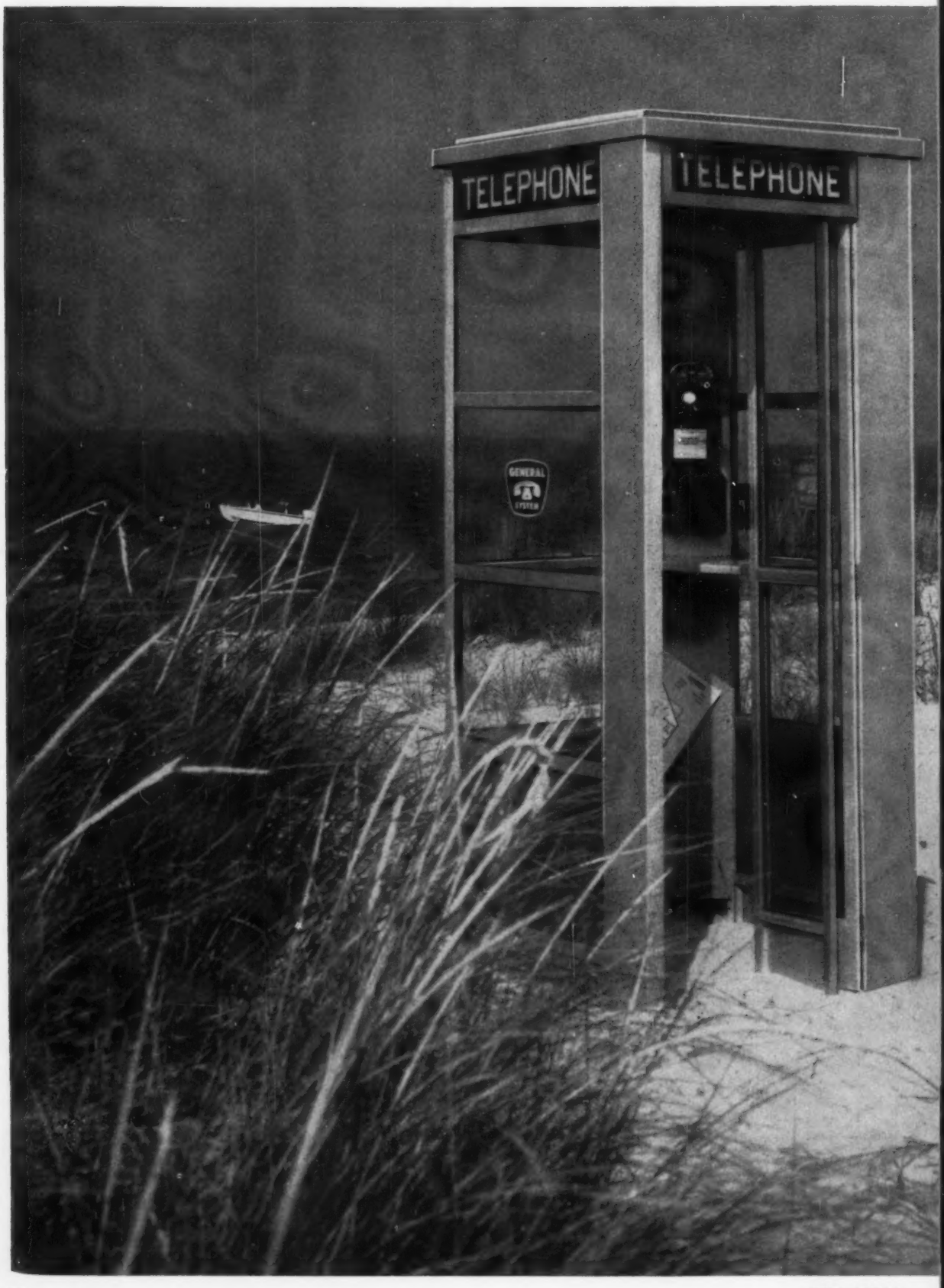
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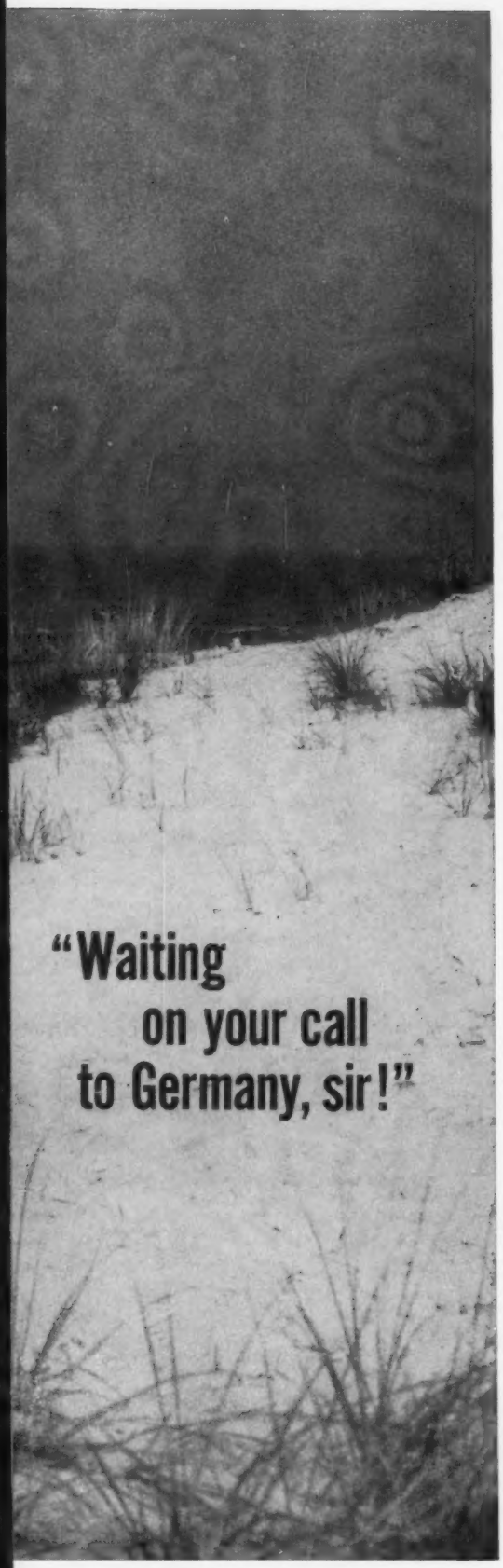
TELEPHONE
GENERAL



No—Portage, Indiana is not on the seacoast, but on a small stretch of Indiana's inland coast, bordering Lake Michigan. Yet, it's 800 miles closer to Hamburg, Germany, than New Orleans, La., is! And thereby hangs our tale.

Except for sea gulls and great blue heron, beavers and an occasional Boy Scout, the beach near Portage, Ind., is sparsely populated—right now. But not for long. For this is the site of a town-to-be . . . a harbor for ocean-going vessels . . . a steel production center that is expected to employ more than 50,000 people!

General Telephone Company of Indiana already has completed plans for serving Portage Township . . . will spend more than $2 million in the proposed construction and conversion program. And, it is expected, some 3,000 telephone customers will be connected to the new facilities at conversion time.

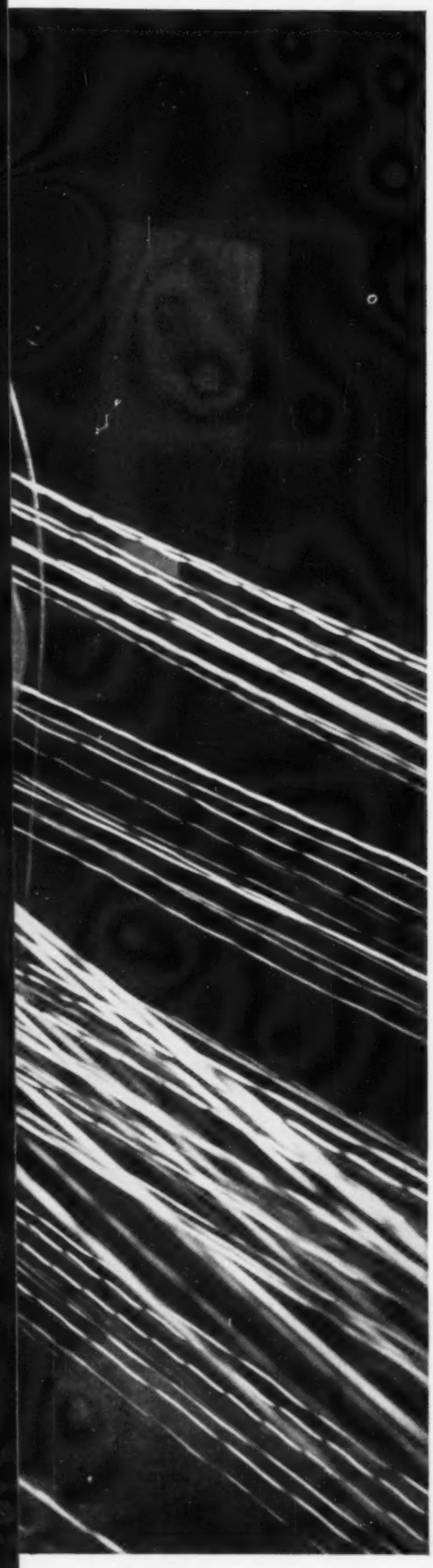
A significant number of the new facilities will be Alcoa® Aluminum booths. Because Alcoa booths serve so many so well in other locations, GEN TEL decided they will earn high revenue—with low maintenance costs—here, too. Because aluminum defies corrosion, the moist lake air and buffeting, sand-laden winds won't hurt it a bit. And because Alcoa booths are colorful, well lighted and sturdy, they attract users! Easily maintained, dirt and grime may be washed off with plain water . . . and aluminum never needs painting!

For more information about Alcoa Aluminum outdoor booths . . . and the new Alcoa compact aluminum booth, write Aluminum Company of America, 1720-X Alcoa Building, Pittsburgh 19, Pa.

"We chose Alcoa booths because they're light in weight yet sturdy," says Mr. P. E. Platt (left), Northwestern Division manager for GEN TEL. "They require a minimum of maintenance, are well lighted, colorful—and really attract users," adds Mr. J. D. Canfield, GEN TEL's district commercial manager.

ALCOA ALUMINUM

ALUMINUM COMPANY OF AMERICA



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Only Qualpeth telephone cables offer these new, exclusive features for the finest in transmission and performance. **Reduced cross talk** with a new oscillating face plate method of stranding pairs into units. This method insures freedom from parallelism between a pair in one unit and a pair in another unit. The end result, cross talk characteristics are greatly improved. **Polyethylene binders:** colored polyethylene binder tapes provide easy identification due to color brilliance and freedom from fraying. **Tape over shield:** an acetate tape applied over overlapped edge of smooth shield provides protection against cutting into sheath. **Sheath uniformity gauge:** tests every foot of Qualpeth cable during extrusion for thickness and concentricity of sheath. Upon customer request, Qualpeth cables will be shipped under positive pressure. Your way of checking against hidden shipment and installation damages. Qualpeth cables are available with aluminum or copper shields, in single or double sheaths, for aerial (including new Figure 8 self-supporting messenger type) duct or direct earth burial installation. Call our distributors for complete details about this outstanding line of telephone cables . . . quality-engineered to give you the finest. **Available for shipment on November 1, 1960.** General Cable Corporation, 730 Third Ave., New York 17, N. Y.

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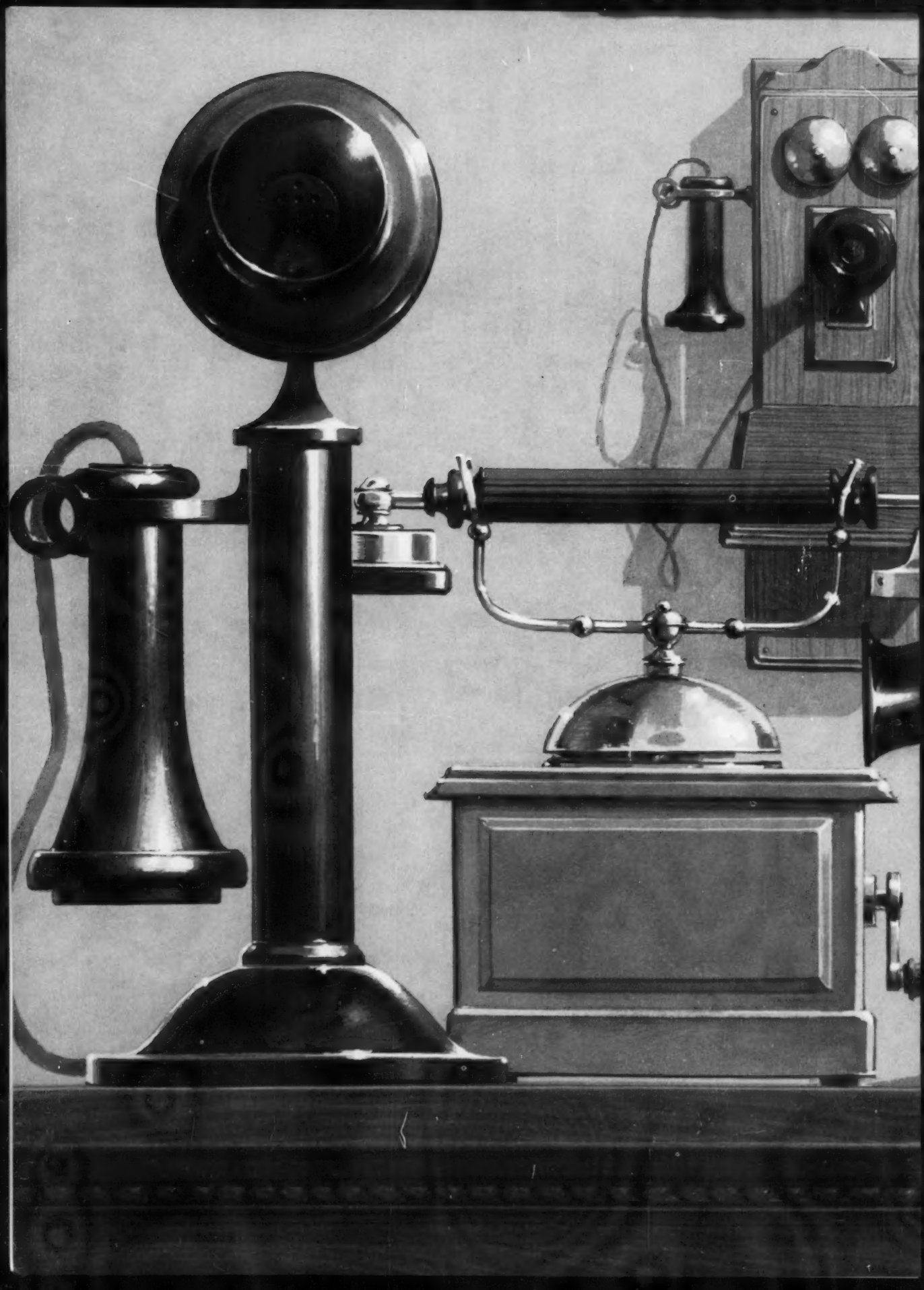

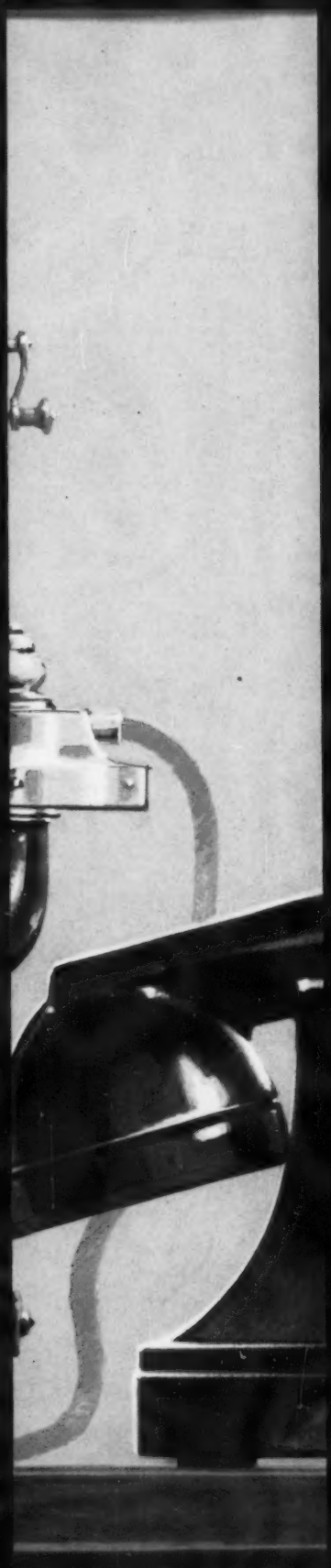

Are you operating a telephone company or an antique shop?

Remember the "old" telephones? Where do you see them today? In antique shops! They are collectors items—museum pieces—nostalgia nudgers!

And what about the telephones you're buying today? If you're buying Ericofons, you're getting the only modern telephone on the market. If you're still buying old-fashioned two-piece phones, you're buying "built-in obsolescence"—it's only a matter of time now before these phones, too, become "antiques," museum pieces. The Ericofon will still be modern long after "today's" phones are only memories!

Next time you buy telephones, stop and think—think hard—do you want to buy instruments that are **already becoming obsolete?**

When you order telephones, order Ericofons—the only modern instruments in the world today—and available only from

THE DYNAMIC FORCE IN THE TELEPHONE INDUSTRY

NORTH ELECTRIC COMPANY

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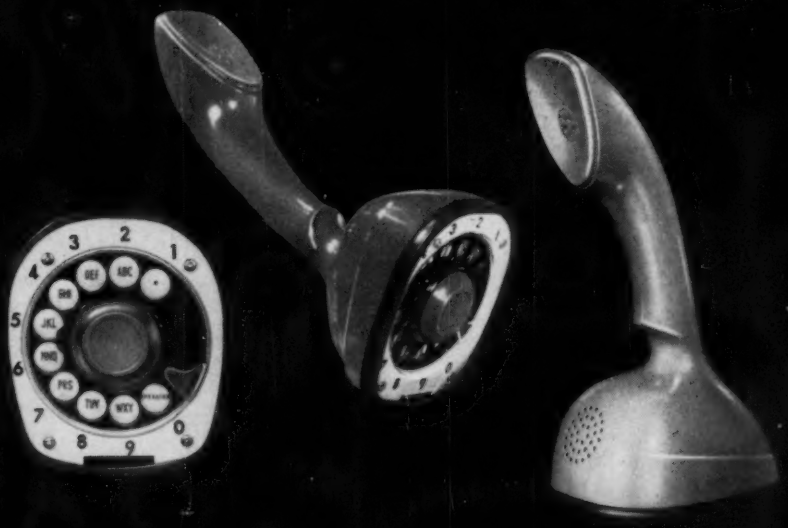

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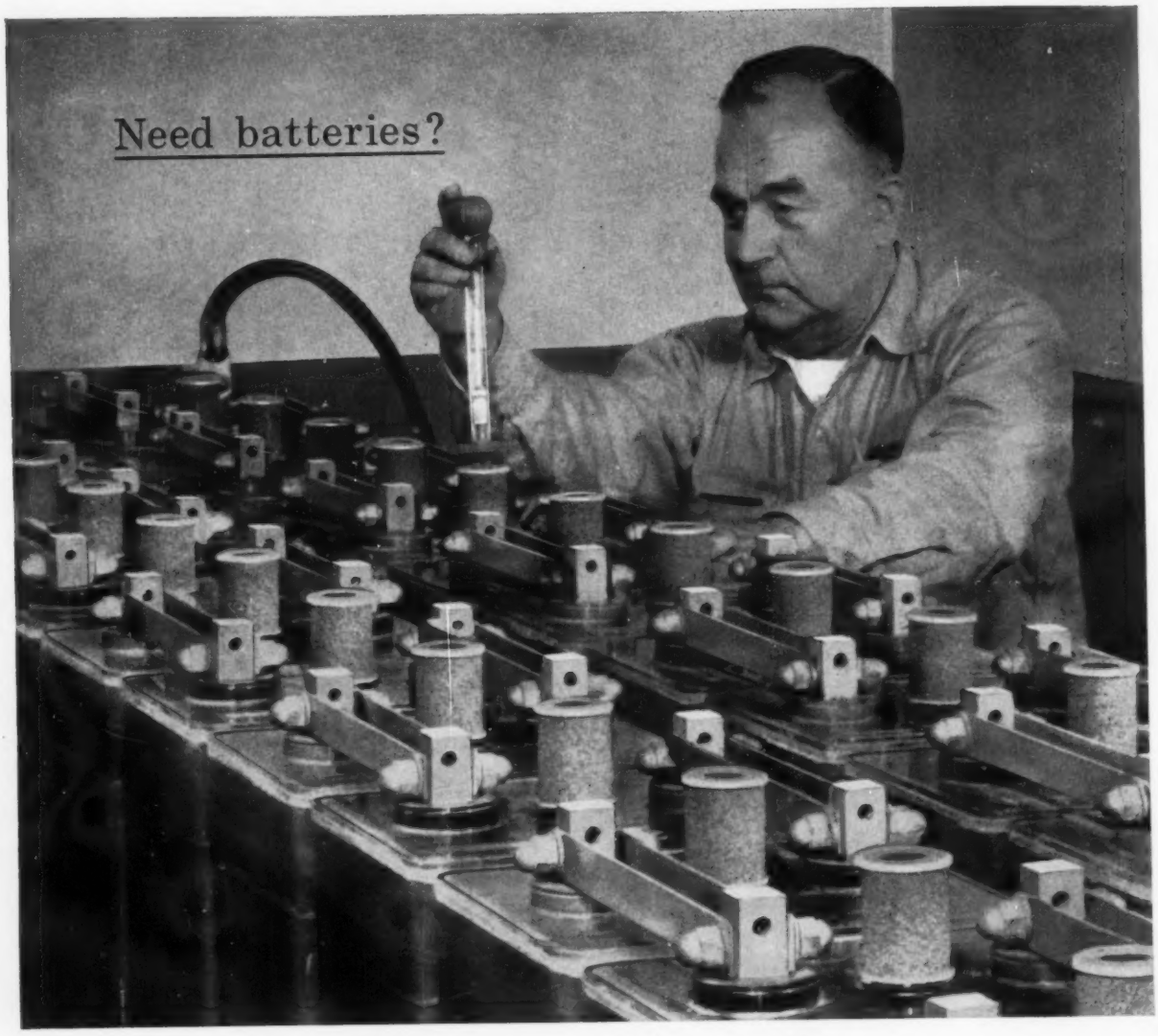

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These bulletins detail C & D's superior construction, contain rack data, and complete specifications on the full line of *PlastiCell* (10 to 1680 A.H. in 37 sizes) and *PlastiCal* (50 to 1680 A.H. in 27 sizes) communications batteries.

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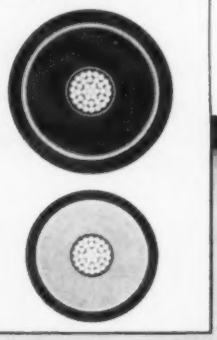
Leading manufacturers now produce power cable insulated with polyethylene based on Monsanto Polyethylene resins, specially developed and perfected by Monsanto. For complete technical data including applicator's information, write to Monsanto Chemical Company, Plastics Division, Room 730, Springfield 2, Massachusetts.

Monsanto®

MONSANTO ACTIVATOR IN **PLASTICS**

Note the slim shape and size of the polyethylene-insulated cable (lower), compared to the old cable (upper) being replaced.



New 15,000 volt polyethylene-insulated power cable installation at main sub-station, Monsanto Chemical Co., Plastics Division plant, Springfield, Mass. Installation-rated at 175 amps, 15,000 volts. 3-phase system, 1 conductor per phase. Conductors are 2/0-37 strand copper (133,100 circular mils). Insulation consists of: 1 layer semi-conducting tape, 297 mil polyethylene insulation, 1 layer non-metallic tape, metal shielding, 1 layer tape, 6/64" vinyl jacketing.

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THE WARREN MFG. COMPANY, INC.

FIRST IN TRANSISTOR PRODUCTS FOR THE TELEPHONE INDUSTRY

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"THINGS TO COME"

Previewed at USITA Convention

By R. C. RENO

A PREVIEW OF "things to come" in communications and the part that the telephone industry will have to play in keeping up with, and adopting, new developments and techniques was given to the 3,300-odd representatives of the Independent industry at the 63rd annual convention of the United States Independent Telephone Association.

The convention was held Oct. 9 to 12 in Chicago.

Many of these new developments, some of which have already been introduced in the telephone field, are designed not only to expand and improve basic local and long distance telephone communication as we know it, but to permit telephone companies (1) to move into the application of electronics as it becomes necessary and (2) to meet competition resulting from establishment of private communications systems by large commercial and industrial concerns.

These new developments, discussed by speakers at the convention's general sessions and departmental conferences, and displayed in many manufacturers' exhibits, affect practically every function and operation of a telephone company, regardless of department.

The theme emphasized at the convention was that no longer can the telephone industry be concerned only with providing traditional voice communications, but it must meet the challenge of providing circuits and facilities to handle transmission of data processed by electronic computers and other developments such as slow-scan video and space communications.

It was brought out at the convention that some of these future developments and the demand for a broader concept of communications are bound to affect most telephone companies, small as well as large, and it is imperative that they move forward and adopt new techniques as they become necessary in their operations.

Also stressed at the USITA meeting is the need for businessmen, including those in public utilities, to become more interested and active in politics and government in order to protect the American private enterprise system against what one speaker, Dr. Nicholas Nyaradi, called "galloping socialism" which, he said, is loose in our country today.

All businessmen must "stand up and be counted" in political affairs, even in cases of controversial issues, if the free enterprise system is to continue, said Dr. Nyaradi, who is director of the Institute of International Studies at Bradley University, and who was Minister of Finance of Hungary before that nation was taken over by communists.

One of the featured speakers at the convention was Dr. Andrew D. Holt, president of the University of Tennessee.

The reception given the news that a human voice had been bounced off a man-made satellite and the public's attitude in 1875 when the announcement was made of Bell's invention of the telephone were compared by Dr. Holt.

In his talk "Echo of A. Bell" Dr. Holt pointed out that education has made all the difference between the enthusiasm the Echo I was greeted with, and the apathy the telephone initially met.

Comparing the two periods, Dr. Holt listed four observations:

(1) Both the telephone and Echo I are products of education; Bell was an educator and scientist and Echo I is the result of scientific research.

(2) The American people today are far better educated than they were when the telephone was invented. Although intelligence of the population probably has not increased, formal education has.

(3) Americans have a greater respect for research and a larger capacity for understanding its value now than they did in 1875. Although the possible practical value of Echo I has only been explained to the public in general terms, the public accepts the potential achievement. Only Bell's close friends, Dr. Holt said, believed in his invention.

(4) Education must have strong public support to succeed in its mission.

Dr. Holt went on to comment that because of the extent of formal schooling in the United States, Americans may take their schools for granted. This, he stated, perhaps explains why teachers are underpaid and schools crowded. He urged the public to support education, because as his comparison had illustrated, "it is the benefactor of the public."

In a panoramic view of man's progress from "Cave Man to Space Man," J. Lewis Powell reminded his audience, "You do not live in an era of changing times. You now live in an era of changing fact. . . . Nobody who ever lived

1960—61 Officers of the USITA

C. C. PEARCE
President

F. G. LaPRADE
First Vice President

H. R. BOLLINGER
Second Vice President

R. E. RUDOLPH
Third Vice President

C. S. BAILEY
Executive Vice President

C. D. BROREIN
Treasurer

G. C. RICHERT
Secretary

C. S. SNYDER
Asst. Secretary

had an experience like yours. More history and more technical progress has happened in your lifetime than in all the previous history of the world—all the way back to Adam. . . . In truth, modern man is a kind of primitive 'Technological Adam' plodding his way from 'Cave Man to Space Man.' . . . Then, suddenly, said Mr. Powell, in 1945, somebody invented the 'A' Bomb, and man turned a corner. Today we are living in a new age. The age of technological leapfrog. Starting in 1945, progress skyrocketed and in each succeeding year, man has made more progress than he formerly made in previous centuries.

In surveying this centuries-long progression, Mr. Powell continued:

"When machines started to replace muscles, inspiration started to replace perspiration. Sweat is no longer a virtue; thinking has become important. Unfortunately, man has not yet begun to realize the irresistible force of ideas.

"Technical knowledge is cumulative . . . Technology is going so fast it has created a new proverb, 'If it works, it's obsolete.' This zooming, constantly accelerating technical progress is the reality with which you will spend the rest of your life. In today's world, much experience becomes obsolete almost as fast as it is accumulated. The modern executive must use creative thinking to find new answers to new problems.

"Man's unused resource is his imagination. Whatever he can imagine, he can do. . . . Technology stampedes forward, while man stumbles forward handicapped by his undeveloped imagination. Handicapped by the primitive experience of a bygone era, he worships the past, enjoys the present, but ignores the future. Man is hesitant to pioneer the frontier of new ideas. . . . Man hasn't yet grasped the fact that brainpower has replaced manpower as a national resource."

New USITA Directors

Re-elected

H. G. ALLEN, Milton Junction, Wis.

F. S. BARNES, Rock Hill, S. C.

H. A. BARNHART, Rochester, Ind.

H. R. BOLLINGER, Waconia, Minn.

C. R. CASHEL, Worthington, Minn.

R. J. FEGAN, Junction City, Kan.

W. C. HENRY, Bellevue, O.

W. A. KERN, Rochester, N. Y.

F. B. McHENRY, Jefferson City, Mo.

P. H. HENSON, Kansas City, Mo.

W. G. WINTERS, Houston, Tex.

Newly-elected

D. F. ANDERSON, Geneseo, Ill.

M. A. CLAY, Lufkin, Tex.

New USITA Officers

President
C. C. PEARCE, Riceville, Ia.

First Vice President
F. G. LaPRADE, Martinsville, Va.

Second Vice President
H. R. BOLLINGER, Waconia, Minn.

Third Vice President
R. E. RUDOLPH, Ellensburg, Wash.

Executive Vice President
CLYDE S. BAILEY, Washington, D. C.

Treasurer
CARL D. BROREIN, Tampa, Fla.

Secretary
GEORGE C. RICHERT, Washington, D. C.

Assistant Secretary
COURTNEY S. SNYDER, Washington, D. C.

In summary, Mr. Powell asserted: "The nation that fails to produce uncommon men will have no leaders to lead the common men of the future. . . .

"We still have no substitutes for thinking people. Let us restore the prestige of brains, engineering brains, management brains, all kinds of brains. While we are at it, let us also provide recognition for those who have ability to get things done! To concentrate only on developing scientists and engineers would be like driving an automobile and concentrating on making one wheel go faster than the other wheels."

The Independent Telephone Pioneer Association held its annual meeting during the convention, the report of which will be published in next week's issue.

The Pioneers elected the following directors: Ray Blain of Falls Church, Va.; J. N. Johnson of Fort Myers, Fla., and C. C. Pearce of Riceville, Ia.

Other directors are: Hugh A. Barnhart of Rochester, Ind.; Bertha M. Eaby of Ephrata, Pa.; D. S. Guild of Honolulu, Hawaii; F. H. MacGougan of Monrovia, Cal.; C. E. McCormick of Johnstown, N. Y. and Berney Simner of St. Louis, Mo.

The Pioneer directors elected the following officers: President, Mr. MacGougan; vice presidents, Mrs. Eaby and Mr. Blain, and executive secretary and treasurer, Mayme Workman of Springfield, Ill.

The board of directors appointed Sophia K. Davis of Springfield, Ill. as assistant secretary-treasurer.

The following USITA directors were re-elected by the convention: H. G. Allen of Milton Junction, Wis.; F. S. Barnes of Rock Hill, S. C.; H. A. Barnhart of Rochester, Ind.; H. R. Bollinger of Waconia, Minn.; C. R. Cashel of Worthington, Minn.; R. J. Fegan of Junction City, Kan.; W. C. Henry of Bellevue, O.; W. A. Kern of Rochester, N. Y.; F. B. McHenry of Jefferson City, Mo.; P. H. Henson of Kansas City, Mo., and W. G. Winters of Houston, Tex.

New directors elected are: D. F. Anderson of Geneseo, Ill., and M. A. Clay of Lufkin, Tex.

Other USITA directors are: J. B. Atherton of Honolulu, Hawaii; E. G. Bellamy of Knoxville, Ia.; C. D. Brorein of Tampa, Fla.; L. D. Densmore of Lincoln, Neb.; H. C. Ebaugh of Havre, Mont.; C. D. Ehinger of Decatur, Ind.; C. W. Haas of Big Timber, Mont.; H. E. Hageman of Lorain, O.; M. M. Hale of Lincoln, Neb.; A. L. Hart of Tucson, Ariz. and H. D. Holderness of Tarboro, N. C.

F. G. LaPrade of Martinsville, Va.; R. A. Lumpkin of Mattoon, Ill.; Kelley McNish of Bristol, Tenn.; P. A. Nenzel of San Francisco, Cal.; H. G. Payne of Export, Pa.; C. C. Pearce of Riceville, Ia.; R. E. Rudolph of Ellensburg, Wash.; R. J. Schafer of Pinconning, Mich.; K. L. Schroeder of Freeport, Ill.; A. R. Stacey of Sunland, Cal.; H. M. Stewart of Cornelia, Ga., and H. W. Vaughan of Fayette, Ala.

The USITA directors elected the following officers: President, C. C. Pearce of Riceville, Ia.; first vice president, F. G. LaPrade of Martinsville, Va.; second vice president, H. R. Bollinger of Waconia, Minn.; third vice president,

(Continued on page 130)

USITA Executive Committee

C. C. PEARCE, Riceville, Ia., Chairman.

H. R. BOLLINGER, Waconia, Minn.

C. D. BROREIN, Tampa, Fla.

L. D. DENSMORE, Lincoln, Neb.

M. M. HALE, Lincoln, Neb.

W. C. HENRY, Bellevue, O.

W. A. KERN, Rochester, N. Y.

R. A. LUMPKIN, Mattoon, Ill.

F. B. McHENRY, Jefferson City, Mo.

P. A. NENZEL, San Francisco, Cal.

R. E. RUDOLPH, Ellensburg, Wash.

USITA

Keystone of Independent Telephony

By FOSTER B. McHENRY*

AS I AM ABOUT to lay down my sceptre and relinquish my office as president of our association, I recall the story about a newly-trained long distance operator who was having her first day on the switchboard. All went well until she was passed for handling her first coin box telephone call. When the customer's initial period had expired, the new operator completely forgot for the moment what she had been taught to say, namely: "It is now three minutes, signal when through please." Frantically anxious to do her duty, however, she swallowed hard and tersely interrupted the caller by saying, "Sir, your time has come!"

Well, it looks to me as though my time has come—my time to discharge one of my final duties as your president by delivering the traditional president's address.

Convention Worthwhile

Once again we have come to this stimulating and exciting city of Chicago in October's bright blue weather to meet old friends and make new ones, to renew acquaintances, to rub shoulders and break bread together in the good old-fashioned American way. We have come here to compare notes and exchange ideas, and to gain information and inspiration, to help us in the successful conduct of our business in the year ahead. Our conventions are always a grand and glorious occasion and it is obvious to all, I think, that this convention is just as grand and just as glorious as any we have ever held.

Since you did me the honor of electing me your president here a year ago I have had many nice things happen to me. But this occasion this afternoon, I think, is the nicest of all. To have the opportunity to stand here on this platform, to be able to look into the faces of so many key men and women in the ranks of Independent telephony, and officially to welcome you to this the 63rd annual convention of the United States Independent Telephone Association is a great and memorable privilege.

As your president, I have traveled extensively. I have attended a large number of state telephone association conventions. I have attended a number of committee meetings and other gatherings and I have learned much about the problems of the telephone business that I never knew before.

Progressive Year

Serving as your president has been an enjoyable and stimulating experience in more ways than one and, as I arise to my feet this afternoon to deliver the traditional president's "State of the Union Message," I want to thank you from the bottom of my heart for the honor you bestowed upon me. I am pleased to have had the distinction of serving as president of this great association.

This has been another great and progressive year for the association which as you know has in its membership 85 per cent of Independently-operated stations. I am not going to give you any detailed report of what we have accomplished, because a specific accounting of the association's affairs during the past year is contained in Clyde Bailey's annual report.

We Enter a New Era

We are entering a new era in the telephone business just as our nation is entering a new era, politically and economically. We are going to be confronted with many new challenges during the years immediately ahead, and I can see great opportunities for us if we use the means now within our grasp to see that the promising prospects for our industry are achieved. It is my sincere belief that one of the most important instruments for continued success will be the continuing organized and management-directed work of our national tool and voice which we call the United States Independent Telephone Association.

That is why I have chosen as my topic, "USITA—Keystone of Independent Telephony." If you will look up the word "keystone" in the dictionary you will find it means: "*A part or force on which associated things depend.*" In my considered opinion we who are associated together in the ranks of Independent telephony are going to become even more dependent upon USITA in the years ahead than ever before.

Before we take a look at some of the challenges and opportunities ahead of us I would like to refer very briefly to one or two matters which have claimed our attention during the past year.

Telephone Excise Tax

Promises come in many forms. Most of them are kept. But a long standing commitment made by Congress again has been unfulfilled and our customers must continue to pay out millions of dollars a year in federal excise taxes on their local and long distance telephone service.

Much has been written and much has been said about this tax, especially during the last two years. It is discriminatory, being levied only on telephone service, and treats an undeniably vital necessity as a luxury. But the main point is that Congress, through

*Mr. McHenry is Immediate Past President of the USITA and President of Capital City Telephone Co. of Jefferson City, Mo.

the years, has promised to relieve the American taxpayer of this excise burden and this promise is yet to be kept.

Despite an unprecedented outpouring of public opinion against the tax, despite the fact that many congressmen voted for repeal and that over 100 bills and amendments were introduced for repeal of the tax last year, despite the fact that the Senate Finance Committee agreed to let the tax die on June 30 of this year—a date voted by Congress last year—despite all this Congress has again reversed its commitment.

Foster B. McHenry (right) receives plaque from USITA Director Hugh A. Barnhart, presented on behalf of the association in recognition and appreciation of Mr. McHenry's service to the USITA as its president during the past year.

Public Pays and Pays

"Fiscal responsibility" was the phrase used by congressmen voting against repeal. It would not be wise, they said, to give up this money-making tax in light of present world conditions and increased government spending. Those voting for repeal cited the fact that it is the telephone customer, not the company, who pays the tax, and that Congress has a legislative responsibility to the public to fulfill its promises.

Whatever the case, the telephone public continues to pay, and pay, and pay.

Our companies and Bell System companies, acting as collection agencies, must continue to take in the excise tax dollars and pass them along to the spenders in Washington. On top of this, our companies will pay their own operating tax bill which can only come from revenues collected from our customers.

So the excise tax is still with us. We lost this round of the battle, but we shall continue to campaign in the interest of justice, urging repeal of the tax on both local and long distance service. Perhaps next year Congress can be induced to find a way to keep its promise.

Wage-Hour Exemption

Joining with other industries which would have been adversely affected, our association again was in the forefront of the battle against the Kennedy minimum wage bill which, in addition to increasing the minimum rate of pay, would have seriously diluted our 750-station switchboard operator exemption.

As you know, we won again when Congress adjourned on Sept. 1 without passing any such legislation. That new minimum wage legislation will be presented when Congress reconvenes in January is a foregone conclusion. Independent companies interested must be prepared again to go to bat this time. Our association will continue to keep its membership alerted, but in the intervening months I urge that you continue to bring your views to the attention of your senators and representatives — including those who may be elected on Nov. 8—both in respect to our exemption and to the proposed increase in the basic hourly wage. Meanwhile, I suggest it would be the better part of wisdom for all concerned to accelerate plans for any and all pending dial conversions.

Numerous other legislative matters claimed our attention during the year but the lack of time precludes me from going into further detail. They will be found in Mr. Bailey's report.

"Where Do We Go?"

At this time of the year when we pause to count our blessings, to take stock of ourselves, and to see how far we have come, the question naturally arises: Where do we go from here? What do we do next? What are our prospects? What are our goals?

For three score years and three the United States Independent Telephone Association has been the keystone of the Independent telephone industry. It has been and will continue to be *a force on which affiliated companies can depend.* One of our chief activities to which we have always looked to the national association for leadership has been that of obtaining for Independent companies their fair and proper share of toll revenue. Negotiations with the Bell System have become more and more a complex and exhausting affair, and it is a job for experts who know their way around in this intricate field fraught with so many obstacles.

At last year's convention, it was reported from this platform that our Settlements Committee had reached an agreement with the Bell System for an annual increase in toll compensation of approximately 12 million dollars, based on estimated 1959 over-all toll traffic volumes, or about 8 million to 9 million dollars of additional revenue annually to Independent companies settling on average cents-per-message schedules. It was reported also that agreement had been reached on increases in settlements for private line services and foreign exchange services totaling approximately $750,000 annually. The total sum going to Independents in 1958 for settlement on interchanged business was approximately 204 million dollars. In 1959 it was 232 million dollars and it is estimated that total receipts to our industry during this year of 1960 will exceed that sum substantially.

Negotiations Resumed

However, with the impact of inflation, of higher taxes, of higher wages and of higher operating expenses generally, it is felt that the share of Independent companies in the total revenue on interchanged business should be larger than the amount we are now receiving, and that the time lag in giving practical recognition to increased costs should be materially reduced.

For this and other reasons your officers and the chairman of your Settlements Committee, acting with the approval of our Executive Committee, approached the Bell System representatives at a conference in New York a fortnight ago at which time we entered into negotiations with the AT&T people looking toward an upward adjustment in national average cents-per-message schedules for "A," "B" and line-haul operations. These upward adjustments, we feel, will more accurately reflect increased Independent company costs of providing Bell-Independent interchanged message toll telephone traffic. These negotiations are going on apace and the association's Washington office will keep you informed as to their progress.

I might add that our Executive Committee has authorized the Settlements Committee to seek the approval of the FCC, by formal proceeding if necessary, for use of the USITA Separations Manual for settlements of Bell-Independent interstate interchanged message toll telephone traffic.

Other Goals

Therefore, it is clear that one of our chief goals for the coming year will be the association's continuing effort to bring these negotiations to an early and profitable conclusion. In this field, particularly, we shall exert our utmost energy to establish the fact that the United States Independent Telephone Association is *"a force on which associated things depend."*

We have many other goals, of course. They include a continuing and unrelenting effort to obtain repeal of the iniquitous excise tax on telephone service, and the preservation of our switchboard operator exemption, as well as other legislative measures affecting the welfare of our companies. It is obvious to members, I think, that our national association is in the thick of the battle every day, looking out for our interests and the interests of all Independent telephone companies in the national theater of activity. During the remainder of this year, during 1961, and during the years to come, the USITA, fulfilling its important role as the keystone of Independent telephony, will continue to concern itself with the serious problems affecting our industry.

In addition to activities on the legislative front we shall continue to represent our companies in matters before the Federal Communications Commission and other governmental agencies in the nation's capital. We shall continue our struggle for the rights of our companies when it comes to the allocation of microwave and radio frequencies. We shall continue our efforts on behalf of Independent companies which are participating in the SAGE network and in other governmental communications projects. In short, we shall continue to do everything in our power to see to it that the Independent telephone industry is accorded its rightful place in the sun as one of the country's outstanding enterprises and as a substantial facet of the American economy.

Left to right: Adam J. Schwartz, Mr. and Mrs. William J. Kern, Jarvis M. Wilson, George Beinetti and Justin M. Williams, all of Rochester, N. Y.

Present Challenges

A while ago I raised the question: What are our prospects? Our prospects, I think, are excellent, *if* we grasp our opportunities, and *if* we face squarely up to the challenges ahead. I believe that the future growth of our business largely will be dependent upon our ability and willingness to say to the public, "Yes, we will treat you as you want to be treated and as you deserve to be treated."

Great changes have taken place in our industry during the past 10 years and they are taking place daily. We have been jolted out of our false sense of security which was engendered by the fallacy that we are a monopoly.

We know that the characteristics of our business have changed. We know that we are not a monopoly and that there are many other places where customers, especially large business customers, can go for communications. Our competitors are snapping at our heels, constantly looking for ways of invading the common carrier field. For these and other reasons we must continue to take steps to strengthen public faith in us as a service organization, and to place our companies and their employes at the highest possible level in the opinion of our customers and the public.

Left to right: H. F. Lello of Northlake, Ill.; Douglas S. Guild of Honolulu, Hawaii; Mrs. Lello, and J. Ballard Atherton of Honolulu.

Public More Demanding

We know that we are giving better service today than at any time in our history. But we know that we must go further. The public is more demanding, and is more intolerant of inferior service than ever before. We must not only be good but we must develop in the public the belief that we are the best.

The image that we seek to build and maintain, or strengthen where it now exists, requires a recognition of the competitive world in which we live and a desire to beat that competition by doing a better job than others. It demands that every public contact be based on the premise that we can provide the service the way the customer wants it, and our first objective is to please him. It insists that our buildings, our plant, our equipment, and our people present to the public at all times

an aggressive, forward-looking, hard-hitting organization that is vital to their well-being. It means performing our outside plant work with a minimum of inconvenience to the public. It means searching out opportunities by all of us to demonstrate our good citizenship. It means gaining acceptance by regulatory and political bodies of the theory that adequate earnings in the long run give better service at less cost.

We Must Sell

It means also that we must strive for good profits by developing jointly and efficiently the full market potential in the communications field. It means we must continue industry-wide promotion in shaping favorable public opinion. We have accomplished a great deal in this regard since we instituted our national advertising program six years ago. That program, I am happy to say, will be continued during this coming year.

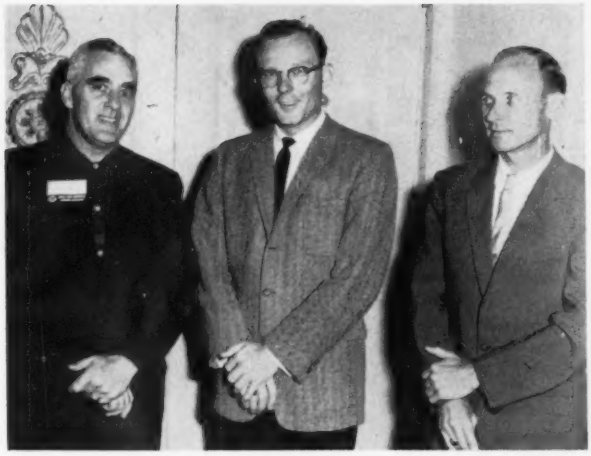
If our companies are to continue to grow on a profitable basis, vigorous promotional effort locally also will be required. When it comes to advertising and promotion, perhaps we can take a tip or two from the Bell System. Last year the Bell System increased its advertising account to $42,224,000, which was an increase of 16 per cent over 1958. About two-thirds of the Bell's advertising budget is for promotional advertising; the balance is to inform the public about Bell telephone policies, and to aid their customers in making the best use of their service.

Must Have Earnings

Speaking of the Bell System, I want to take this occasion to say that I am sure most of us agree with a statement made recently by AT&T President Frederick R. Kappel, who, in emphasizing that telephone companies must grow as a business that can meet competition wherever it may develop, said:

"The continuing essential is that we have real freedom to manage. Good earnings, good profits, for instance, are fundamental to our ability to make the investments in the future that produce progress. Regulation, necessary as it may be, must still leave room for adequate incentives and adequate rewards. And the general attitude of government must be such as will encourage effort, rather than discourage it. We deeply want to be—and our country needs us to be—a vital, buoyant, dynamic force for progress. To be this kind of force, this kind of organization, this kind of people, we need reasonable freedom; freedom under regulation, to be sure, but freedom just the same."

As we reflect on the road ahead, we are confronted with more than a need for growth of organized activity as represented by our national association. The growth of organized activity—and believe me we have grown remarkably, especially these past few years—increases the need for vital, strong-minded people who are trying to develop their unique individual capacities to the utmost. No organized effort can long succeed, or even move in the right direction, except as able individuals make their high personal and distinctive contributions to it.



Left to right: F. W. Dickerson of Jacksonville, Fla.; E. L. Barnes and Lad A. Barnes Jr., both of Rock Hill, S. C.

We have in our audience and in attendance at our technical conferences a healthy representation of young people, some of whom are coming up in management, including those who are graduates, so to speak, of our Management Development and Engineering Seminars. At the risk of seeming a little pedantic, may I say to all of you —and especially to you younger men and women—there is only one person who can develop your capabilities, and that is you yourself. This is your responsibility and it cannot be anyone else's no matter how much training you receive, no matter how much other people help you, no matter what things are put in your way to stimulate your mind and nourish your growth—none of this can ever take over your development as a person. Only you can develop your own powers.

Political Responsibilities

As we approach one of the most important elections ever held in this country, may I suggest that you take your political responsibilities seriously. In a democracy, the only good citizenship is active citizenship. The kind of government we have, both locally and nationally, will always depend upon whether you and I make government our personal concern or decide to leave it to the other fellow.

Work for what you believe is right and don't hesitate to change your mind when you find out that you have been wrong. And may I suggest that you measure your political judgment by the standard of what you think is right for the country, for the whole community rather than what may serve the best advantage of any group. The questions we face nowadays are so big we cannot afford small-minded answers.

A Big View of the Future

As we stride confidently forward to meet the challenges of the sixties, let us take a big view of the future and not a little one. I say this because a big future can only come from what we have to give it. Some of us can give more than others, it is true, but life is worthy of all that each of us can offer. And the first thing to do is to see life as large, see it as great, see it as limitless in challenge and opportunity.

As we pledge ourselves to become good and worthy citizens, I know that I can pledge to you the continued assistance, counsel and guidance of our association to help all of us become better telephone people and more competent and better equipped to meet the problems of our industry — problems which are bound to present themselves as the electronic age progresses and as the furnishing of communications services grows more exacting and complex.

Having been privileged this last year to see first hand how your association, its officers, its directors and its competent Washington staff functions, day in and day out, in the interests of Independent telephony, I can promise you that with your cooperation and God's help, the association will in the years to come continue as it has in the years before to be the keystone of Independent telephony—*a part or force upon which associated things can depend.*

Excerpts from Report of

USITA Executive Vice President

By CLYDE S. BAILEY

IT HAS BEEN my custom each year to present to our convention a fairly comprehensive report on the association's activities. It might be called an accounting of stewardship.

In the present report I shall refer to the state of the general health of the association, touch upon the status of its membership, and refer to the nature of a trade organization and of organization employment. I shall comment upon legislation affecting the interests of Independent telephone companies, and then deal with formal proceedings at the FCC in which we are taking an interest. I shall also refer to certain association activities of a general nature.

A Word of Appreciation

In addition to an executive vice president there are employed in the association's Washington office six specialists: George C. Richert who serves as secretary, engineer and assistant treasurer; Courtney S. Snyder who serves as assistant secretary and accountant; Leon F. Roberts who serves as director of information; Mervin H. Alexander who serves as settlements coordinator; Thomas R. Warner who serves as radio engineer; and John Staurulakis who serves as settlement studies engineer.

We, all of us, wish to express to the members of the association appreciation for the opportunity given us to look out for the interests of Independent telephony in Washington, and the privilege of serving the association and the great army of Independent telephone companies and manufacturers comprising our membership. . . .

Another Great Year

It is not surprising that the past year should have been one of the most active in the association's long history. This has been true on the legislative front, on nationwide toll compensation studies, on nationwide communication systems for the military, on matters pending before the Federal Communications Commission, and on many other subjects. . . .

Included in the membership of our association, in addition to operating companies in the original forty-eight states, are companies in the newest states, Alaska and Hawaii, as well as in Puerto Rico. . . .

The relative size of the two branches of the telephone industry is shown in the following tabulation:

	Bell System	*Independent*
Total Telephones	60,111,000	10,785,000
Number of operating companies	23	3,560
Number of exchanges	7,050	10,760
Investment in telephone plant	$22,847,768,000	$3,580,369,000
Gross revenues	$ 7,571,536,000	$ 915,189,000
Number of employes	597,100	100,000

The revenues of each of 102 Independent companies now exceed one million dollars a year, with the largest company grossing more than 116 million dollars in 1959. More companies are graduating into the million-dollar class each year. The smaller companies however will continue to be important parts of the economic and social life of thousands of towns and communities where they continue to provide an essential service.

There are about 133 million telephones in the world, of which 53.3 per cent are in the United States. New records are being made by both Bell and Independent companies each year. The increasing demand for telephone service continues. More customers are being taken on every year. Technological developments are going forward. Direct Distance Dialing, mechanized toll ticketing, the utilization of radio in its various forms, the growing possibility of the use of satellites high in the sky, and almost myriads of other innovations are constantly opening new frontiers. They all mean more and better telephone communication for the American people whose demand for quicker, more comprehensive service seemingly has no bounds.

Conversions to dial operation continue to go forward with rapidity. Whereas 10 years ago only 45 per cent of Independent telephones were dial operated, today the figure is more than 85 per cent. The percentage of dial telephones in the Bell System is 95.7. Independent companies are being encouraged to convert their exchanges to dial operation as fast as possible. This is demanded not only by the needs of the public for improved service but is called for by the growing impact of higher and higher wage costs incurred in manual operation. . . .

The percentage increase in the number of Independent telephones has far outstripped the increase in population. For example, the population increased 39 per cent between 1935 and 1959, but the number of Independent telephones soared 244 per cent.

This is evidence that telephone men and women have been alert to opportunities and recognized their public service responsibilities. The past 15 years, those since the end of World War II, have been ones of fantastic growth. They have been a challenge to

the ability and sagacity of management. They have presented an equal challenge to those who have had to engineer, design and install plant additions and improvements. And, of course, the years have also successfully tested the mettle, imaginativeness and resourcefulness of telephone manufacturers.

Still a Big Job Ahead

Today there are 70,895,000 telephones in the United States, including Puerto Rico,—60,110,000 in the Bell System, 10,785,000 in the Independent field. This is more than all of the telephones in the rest of the world. Nevertheless it is a fact that about one family in five in the United States is still without a telephone.

In this situation lie vast opportunities for additional business. As living standards and incomes increase in the lower economic strata, new demands for communication service will be created. To help develop the potential, telephone companies must make market research tests, continue to emphasize selling techniques, and study ways to reduce costs in order to make telephone service available to more people at the most reasonable cost possible.

In achieving these objectives it would be most unwise to overlook the interests of the investing public. The man or woman who invests money in the telephone business or any other enterprise has a right to recognition. The investor has well been called the one indispensable person in a free economy. If he doesn't receive adequate recognition he will transfer his savings to another commercial activity where the grass is greener. This very natural and practical economic fact must be given more sympathetic attention by regulatory authorities as well as by others. In a highly competitive money market no investor is required to let his investment remain in any business. To overlook this very simple fact is to court stagnation and neglect of growing public needs.

For the solution of our seemingly never-ending problems we must continue to look to the best leadership available. We must above all continue to have faith that solutions are bound to come in the future as they have in the past.

Left to right: Sophia Davis of Springfield, Ill.; Katharine A. Bauer of Jefferson City, Mo.; Genevieve Sauerhage of Bloomington, Ill., and Mayme Workman of Springfield, Ill.

The Statistical Pulse

One of the important activities of our association is the compilation and distribution of data relating to the operations of Independent telephone companies. Information for the current statistical volume covering the year 1959 was obtained from most Class A and B companies but not all. Reporting C and D Companies represented a small minority of the total stations of such companies.

The number of reporting companies by classes for the year 1959 compared with 1958 was:

	1959	1958
Class A	245	230
Class B	150	124
Class C	86	98
Class D	52	52
	533	504

Because of the difference in the number of reporting companies from year to year completely accurate comparisons with earlier years are impossible. Yet there are some interesting yardsticks.

Our 1960 statistical volume, reflecting figures for 1959, shows that 245 Class A companies accounted for 8,451,549 stations; 150 Class B companies 349,101; 86 Class C companies 103,697; and 52 Class D companies 24,360, a total of 8,928,707. This represents a station increase over 1958 of 599,362. The company-owned stations of these 533 companies make up about 83 per cent of the 10,785,000 stations served by 3,560 Independent telephone companies at the end of 1959.

Total plant investment of the reporting companies on Dec. 31, 1959, amounting to $3,098,369,000 was $366,624,000 greater than the amount recorded at the close of 1958. Reporting companies' total plant investment was 87 per cent of the total Independent industry, which was about $3,580,369,000.

In 1959, the reporting companies had gross operating revenues totaling $801,289,000, an increase of $97,497,000 over 1958. Thus the 533 reporting companies accounted for about 88 per cent of the

Left to right: Morris S. Burton of Tyler, Tex.; Jack Haley of Austin, Tex.; William McCluskey of Rock Creek, O.; Leon Roberts of Washington, D. C., USITA director of information, and Hamilton A. Cunningham of Albany, N. Y.

estimated total revenue of $915,189,000 for 3,560 companies. The revenue of $801,289,000 was derived from the following sources:

		Percent of Total
Local Service ...	$519,394,000	64.8
Toll Service	$254,147,000	31.7
Miscellaneous ...	$ 27,748,000	3.5

Annual gross operating revenue per station rose from $87.21 in 1958 to $92.68 in 1959, while operating expense, including federal income and other taxes, rose from $71.78 to $75.70. The average revenue per station of the 245 Class A Independent companies was $93.92. It is interesting to note that the average per station revenue in the Bell System was $131.28 while operating expenses including all taxes amounted to $109.56. The ratio of expenses to gross revenue for all reporting Independents was 82 per cent. This compares with 83 per cent for the Bell System.

Operating expenses excluding taxes for A, B, C and D Independent reporting companies rose from $442,084,000 in 1958 to $488,822,000 in 1959. The increase in operating revenue exceeded the increase in operating expenses by $50,759,000.

The tax burden amounting to $165,683,000 increased $28,500,000 over 1958. Federal income tax expense accounted for the largest increase in operating cost. This amounted to $76,461,000 in 1958, and in 1959 was $94,248,000, an increase of $17,787,000.

The total amount available for fixed charges at the close of 1959 was $152,952,000 compared with $130,163,000 at the close of 1958. Net income available for fixed charges increased in 1959 over 1958 by $22,769,000.

While, as heretofore, shown plant investment in 1959 increased $366,624,000, net income available for dividends increased $16,806,000. Net income available for dividends rose from $86,409,000 in 1958 to $103,215,000 in 1959.

Left to right: J. W. Baker of Coeur d'Alene, Ida.; Eldon Eckles of Blue Earth, Minn., and George Hearne of Kansas City, Mo.

The 1959 amount represented a return of 3.3 per cent upon a total undepreciated plant investment for A, B, C and D reporting companies of $3,098,369,000. For Class A companies above, the ratio of return was 3.4 per cent. In 1958 the return on a plant investment of $2,731,745,000 for all reporting companies was 3.2 per cent. . . .

Rate of Return

It might not be entirely out of place at this point to refer briefly to the subject of rate of return.

The rate of return ratios pointed out in the foregoing summary for Independent companies seem unrealistically low, particularly in these inflationary times and in the light of competitive factors that always exist in a money market in which many interests are vying for the investor's dollar.

I would like to emphasize the very substantial importance which attaches to an adequate rate of return for a telephone company in these days of dynamic growth. Under public regulation as it has existed, insufficient amounts have been earned to enable capital additions or improvements to be made out of earnings. Telephone companies, in common with other regulated business, are obliged to look to investors for funds for improvement and expansion. In a highly competitive money market telephone companies because of low rates of return allowed by regulatory commissions have been at a disadvantage in relation to non-regulated business. We believe that more realistic consideration must be given by regulatory commissions to the rate of return element if telephone companies are to be able to plan ahead and acquit their full service obligations to the public. . . .

Legislative Problems

I now move to the broad field of legislation. There are six pieces of legislation of interest to Independent telephone companies:

(a) The 10 per cent excise tax on telephone calls
(b) Withholding tax on dividends
(c) The switchboard operator exemption and an increase in the minimum wage
(d) R-E-A legislation
(e) The securities exemption
(f) The outlook for corporate income tax and other tax reduction

(a) *The 10 Percent Excise Tax.* Many people were sorely disappointed by the action of the Senate last summer in extending the excise tax on local service for another year. The disappointment was all the more poignant because in 1959 Congress had placed a termination date on the tax under which it was to expire by operation of law on June 30, 1960.

The Senate vote extending the tax, taken on June 20, was 54 to 30, following a floor fight in which the leaders of retention were Democratic Floor Leader Lyndon B. Johnson, Republican Floor Leader Everett Dirksen, and Sen. Harry F. Byrd of Virginia, chairman of the Senate Finance Committee. Sen. Robert S. Kerr of Oklahoma led the fight in support of letting the excise tax lapse.

Left to right: H. A. Drydale of Chicago; A. A. Wilson of Mattoon, Ill., and A. C. Wolff of Chicago.

The Senate on the same day voted to retain the 10 per cent tax on train, bus and airline passenger fares. . . .

The refusal of Congress to eliminate the tax on local exchange service leaves us with no alternative but to seek relief at another time. We know that this levy is an inequitable and discriminatory one, and it is so recognized by many authorities, regulatory commissions, subscribers, service organizations, business establishments, and telephone companies. It is a tax on an essential service. The requirements of justice should sometime cause it to be consigned to oblivion.

On this matter a battle was lost at the last session but not a war. We must go forward again in 1961. When doing so, of course, we shall be taking a calculated risk, one that involves the reality that if the federal tax is removed, New York State will levy a tax at the local level and the likelihood that some other states might do likewise.

(b) *Are We Going to Have a Withholding Tax on Dividends?* While I am discussing taxes permit me to report a recent development that might possibly lead to legislation calling for a withholding tax on corporate dividends.

For about 10 years proposals have been before Congress relating to this matter. In 1950 and 1951 they actually received House approval, but each time were stymied in the Senate. It now appears, however, that conservative Sen. Harry F. Byrd of Virginia, chairman of the Senate Finance Committee, has by vote of the committee instructed the staff to study ways of withholding income taxes on dividends at the source. The Internal Revenue Service says that about five billion dollars of dividends and interest reported by corporations and banks has not shown up in individual tax returns.

Senator Byrd says that approximately 400 million dollars in federal revenue that is being lost could be saved if a satisfactory system of withholding were devised.

It is easy to sympathize to some extent with the tax collectors on this issue. But at the same time it certainly should be recognized that added burdens would be imposed upon corporate business if it were compelled to handle all the paper work that would be involved in a withholding system—paper work that would be in addition to what is already required in respect to telephone excise taxes, unemployment taxes and various other levies.

(c) *The Switchboard Operator Exemption and the Minimum Wage Bill.* I am glad to report that the switchboard operator exemption in the Wage-Hour Act is still a part of the law of the land. But in its present form it had a close call. It was saved because of inability of a conference committee to reach agreement on differences between a bill as passed by the House and a bill which passed the Senate. There were many other provisions in both bills that were highly controversial.

Left to right: Dee Cole of Greenville, Tex.; M. R. Thompson of Toledo, Ia.; John McHenry of Jefferson City, Mo., and J. G. Kreamer of Kansas City, Mo.

All bills which were still pending when the second session of the 86th Congress adjourned on Sept. 2 died and will have to be reintroduced at the incoming Congress next January if they are to be considered further.

That minimum wage and exemption legislation will again be presented is a foregone conclusion. In the time intervening between the present and the reconvening of Congress Independent companies interested in preserving the switchboard operator exemption and opposing an increase in the minimum wage should embrace every opportunity to make their views known to the members of their Congressional delegations. Care should be taken not to overlook any new members of Congress who might be elected in November. . . .

The switchboard operator exemption on a 500-station exchange basis was written into the law in 1939 at the request of the USITA, one year after the Wage-Hour law was enacted. In 1949, again at the request of our association, the exemption was increased to include exchanges up to 750 stations. Thus our association has stood guard over the exemption for 21 years.

The exemption has saved the life of thousands of small exchanges. In the intervening years conversions to dial operation have gone forward at such a pace that today more than 85 per cent of all telephone exchanges in the Independent field are mechanized. There are still a number of exchanges that have not yet converted. If the switchboard operator exemption could be preserved for an additional short period of time, say from three to five years, it would afford an opportunity to these exchanges to convert to dial operation. Upon the completion of that program there would no longer be need for an exemption.

When considering legislation of the character under discussion each Independent company should make studies to determine the impact upon it of an increase in the statutory minimum wage. There is certain to be an increase of some kind in the foreseeable future, and it is also more than likely there will be a revamping of the exemptions now in the law. When an increase in the minimum is legislated it will probably have an effective date anywhere from 90 to 120 days in the future.

When talking with members of Congress care should be taken to point out the effect of an increase and its meaning both to the telephone user in terms of necessary increased subscriber rates, and to the telephone company in terms of its total wage costs in relation to available revenues. . . .

(d) *REA Legislation.* President Eisenhower in his budget message to Congress in January, 1959 recommended encouragement of "private lending through flexible interest rates for government credit programs." He stated that in a number of important cases present legislation sets "inflexible and uneconomic restrictions on interest rates creating unintended and hidden subsidies and requiring excessive use of federal funds by discouraging private lending."

In the President's budget message on Jan. 18, 1960, he said:

"The Rural Electrification Administration currently finances the capital needs of the cooperatives by borrowing from the Treasury at the statutory interest rate of 2 per cent and relending

at the same rate. Legislation is proposed under which REA would (a) borrow from the Treasury at not to exceed the average rate of interest payable by the Treasury on recently issued long-term marketable obligations, and (b) make future electric and telephone loans at the same rate plus one-fifth of 1 per cent to cover administrative expenses and estimated losses. Legislation now before the Congress to place the operations of this agency on a revolving fund basis should also be enacted.

"It is vital, looking ahead, that legislation be developed to enable telephone as well as electric borrowers to obtain funds from a mutually owned financing institution to meet the needs for the future growth of these borrowers. Under this longer range plan, loans would also be available from the Rural Electrification Administration to meet special circumstances. The Secretary of Agriculture will work with REA cooperatives and other interested parties in developing such a proposal."

The first session of the 86th Congress witnessed the introduction of a dozen or more bills in both the Senate and House relating to the REA, but none reached the committee hearing stage. Two more bills were introduced this year. None of these related to the President's proposed mutually owned financing institution.

Some of the bills proposed to increase the interest rate on loans to a level corresponding to current yields on government obligations, plus an amount sufficient to cover administrative expenses and probable losses. Others proposed to make the REA an independent agency, outside of the Department of Agriculture. . . .

(e) *The Securities Exemption.* Despite the recommendations of the President's cabinet, the Securities and Exchange Commission and the support of our association, investment groups and the New York stock exchanges, Congress has not acted favorably on bills to increase the exemption under the Securities Act. At two different times in the past we succeeded in getting the Senate to approve an increase to $500,000 in the present $300,000 exemption, but both times the House of Representatives has failed to act.

At hearings in the summer of 1959 before a House sub-committee we stated that inflationary considerations were justification for increasing the exemption to 1 million dollars. Differing from the Senate view, the full House Interstate and Foreign Commerce Committee stated that in its opinion there was no need for any increase in the exemption. . . .

Arnold Toynbee, the historian, tells us that out of 21 civilizations which have vanished, 16 collapsed because of decay within.

No one would be so rash as to say that ours is vanishing. Yet anyone who reads the daily newspapers must be struck by the fact that in a number of important areas of human conduct there has been a serious recession in morality.

Left to right: J. P. Galligan of Burlingame, Cal.; R. C. Reno of TELEPHONY; Kelley McNish of Bristol, Tenn., and E. H. B. Bartelink of Concord, N. H.

The revelations of the McClellan labor rackets committee on payoffs, unlawful picketing, boycotts, arson, union strong arm methods, the improper use of union funds and the arrogance of labor leaders are certainly enough to make one more than skeptical. Skeptical of the efficacy of the American educational system and religious training, skeptical of law enforcement, skeptical of legislative processes.

Skeptical too of the willingness of the American people and especially of American businessmen to do something about it. In far too many instances there has been apostasy from moral rectitude. In the field of legislation the record shows an alarming reluctance to face up to the realities of the excesses of labor unions.

It also shows an indisposition to protect the legitimate fruits of mental and physical labor. The draining off by government through the process of tax laws of the rewards of human effort has long sapped at the roots of initiative and incentive.

The growing development of a welfare state in which more and more people look to a benevolent Uncle Sam to bail them out is a token of the times. More and more pleas assail the ears of Congress each year for spending more and more money on more and more things. . . .

Government is getting bigger and bigger. We seem to ignore a warning by a statesman of old that government always tends to become a conspiracy against liberty. Even back in the days of Jefferson when life was a good bit more simple than it is today the sage of Monticello said: "We have more machinery of government than is necessary, too many parasites living on the labor of the industrious."

Everybody, of course, knows these things. But since we have become accustomed to soft living, less and less attention is being given to the responsibility of citizenship. There must be a reawakening. Idealism is not worth much unless it is put into practical effect. A special obligation rests upon businessmen. They are on the firing line. Daily they see evidence of the moral defalcation of labor. They are witnesses to the inroads of government in almost every avenue of human effort. . . .

Businessmen have been successful in selling goods and services. They have not always been successful in selling good government. They must make a greater effort. There are some important elections coming up this fall, for national office as well as state office. One-third of the Senate and all members of the House of Representatives will have to be elected. Laying their plans well in advance of the day at the polls, more businessmen must begin practicing citizenship with vigorous action, not merely talking about it.

Interests at the FCC

Let me now turn to the Federal Communications Commission, an agency set up by Congress 26 years ago in 1934 to regulate the radio and television broadcasting industry and communication common carriers.

The FFC has been much engrossed during the past year in conducting hearings relating to abuses in television and radio. There has been considerable criticism of the commission in congressional and other quarters, including the press, growing out of a feeling that it has not exercised the diligence which the public interest demands in cracking down on offending practices. The commission devotes the major part of its time to non-common carrier work. The result is that much

(Continued on page 130)

The Great Electronics Future of Telephony

By DON G. MITCHELL*

IN SPEAKING about "The Great Electronics Future of Telephony," I have in mind the joining together of two great technologies — *telephony and electronics* — to produce a far broader concept of communications. This concept involves far more than simply applying electronic devices and equipment to telephony. It is a case of extending our thinking beyond the traditional forms of telephony and the obvious applications of electronics, and coming up with entirely new ways of meeting the growing and changing needs of our customers.

It goes without saying that all of you are acutely aware of the enormous expansion of the telephone business in recent years because you played a vital role in bringing it about. However, it would be well if I reviewed very briefly the developments leading to the emergence of the electronics industry as we know it today, so we can appraise more effectively its potential contributions to communications. Several years ago, one of the national magazines described the electronics industry as "the world's most promising technological revolution." Some people in the industry thought this description was a trifle too enthusiastic, but I dare say if you asked each one of them today what their reactions are, they would say that the revolution has indeed occurred. Although it has been of greater magnitude and more successful in some areas of the industry than in others, taken in its entirety, the revolution has been a technological and industrial phenomenon that has never been equaled in modern industrial history. If for no other reason, this description is valid because of the relatively short length of time in which the revolution has occurred.

You don't have to look back very far to trace the development of the electronics industry. As recently as the 1930's, there was no electronics industry as we know it today. Certainly, the principle of electronics had been put to good use for a number of years in radio broadcasting, in radio communications, and in the manufacture of radio equipment, but the word "electronics" really did not appear until the early years of World War II. In fact, you may recall having heard of electronics along about 1942 or 1943 and wondered what the engineers were talking about. The reason a term of this kind became necessary was the fact that the long-since known principle of creating energy through the generation of electrons in a vacuum by applying electricity was being applied to such dramatic new developments as radar, microwave radio, the proximity fuze, electronic gun-firing systems, and many others. Whereas the atomic bomb certainly hastened the end of the war, electronics not only played a major role in the ultimate victory through such equipment as I mentioned but also was invaluable to the atomic bomb project itself.

When you add up all of the scientific and technical developments made during the war, they add up to more technological progress than in the past 20 or 25 years — which is at least some consolation, slight as it was in view of all the lives that were lost and the damage done. But progress *was* made, and out of the war came a new major industry — electronics. After the war, military electronics went on to new high levels as national defense became more and more *electronics* defense, television picked up where it had left off in 1940, and commercial and industrial electronics began to climb very rapidly.

From a total volume of some 500 million dollars before the war, and employment of about 70,000, the electronics industry multiplied ten-fold by 1950 and reached 5 billion dollars in the span of only 10 years. This year, electronics sales and revenues should reach 15 billion dollars, with employment of some 2 million, of which about 750,000 are in electronics manufacturing, and the remainder in broadcasting and radio communication, distribution and service.

Each of the principal areas of the electronics industry continues to have a strong potential, some of the fields, of course, having larger potentials than the others. Defense electronics has more than doubled in the past five years, and will total about 5 billion dollars this year. You can readily appreciate where a total of this magnitude comes from when you bear in mind such developments as early-warning systems for the detection of intercontinental ballistic missiles; defense systems which protect our supersonic bombers by putting out a signal that would baffle enemy radar; guidance systems for missiles and rockets; navigational and communications systems for aircraft, ground units, ships, and submarines, and a host of other developments. The ballistic missile early-warning system, which is conveniently called "BMEWS," is a splendid example of the job electronics can do in communications. Those four giant radars up in Greenland are on the alert 24-hours a day and penetrate 3,000 miles toward Russia. If a Russian missile should enter their radar beams, they would flash a warning over a 6,000-mile closed-communications circuit to our retaliatory and defense forces, and these forces

*Mr. Mitchell is president of General Telephone & Electronics Corp.

would have from 15 to 30 minutes to strike back. Until recently, they would not have had ample advance warning. Our company is playing a very important role in this tremendous project, and we are particularly proud of that fact because it demonstrates so well the many benefits that can be derived from the combined efforts of telephone and electronics people.

Defense electronics today represents some applications which none of us in the industry felt were remotely possible a few years ago, and this again proves how rapidly your old concepts change and entirely new concepts are developed when technology puts some new information and new equipment into your hands. This has been one of the great benefits from electronics — we not only have been able to develop better ways of doing some of the things we already knew how to do, but we came up with some new benefits that we didn't know could be realized. Electronics showed us how to solve some problems that no one knew existed.

This has been particularly evident in commercial and industrial electronics—which includes, of course, the application of electronics to telephony. Ranging all the way from tiny transistors to complete communications systems, commercial and industrial electronics has gone through the most rapid relative growth of any segment of the industry and today represents a 3 billion-dollar business, an increase of 120 per cent in the past six years. This rapid growth reflects the development of the far broader concept in the telephone business — the concept of communications rather than telephony. This "new look" in the telephone business didn't spring from any single invention or any single new technique, but has evolved from a multitude of things. And today we look at communications as *the job of using a steadily broadening range of equipment and techniques to get the right information to the right place at the right time* — whether it is a telephone conversation, or business data, or anything else. In order to do this, in order to get *the right information to the right place at the right time*, we must utilize a more complicated technology and a wider range of techniques than any other major industry.

Left to right: John A. Aigler of Bellevue, O.; H. M. Stewart of Cornelia, Ga.: Mrs. Charles A. Henry of Bellevue, and Mr. Henry, and Frank Barnes Jr. of Rock Hill, S. C.

The impetus behind this large-scale development is, of course, abundantly clear to everyone in the telephone business. As we all know, these techniques arose from the necessity for providing more and more telephone service to more and more people, and yet doing it without causing a major upheaval in our industry. Some day,—and that day is not as far off as you might think,—a telephone company will be able to send practically any kind of information to anyone in any place provided he has telephone service—and that will mean not only conversation but it will also mean images, whether they might be a photograph or a drawing, and that wide range of information that comes under that handy little name of "data"—a financial summary, an engineering analysis, an inventory report, or perhaps a detailed and understandable description of how to fix a gas turbine generator set.

And so you can see what I mean when I say that telephone companies have become *communications* companies — and their services are becoming broader and more varied all the time. Our entire sphere of activity has broadened not only to the point that our facilities are being used more and more for other-than-voice communications, but we are thinking in terms of entirely new concepts of communications. Now, then, just what are we trying to do? What new concepts will we have to come up with? We could spend more hours than any of us can spare talking about that, but perhaps I can sum it up by saying that we need *faster* means of communications, and we need more *versatile* means of communications. At the same time, these faster and more versatile techniques must be *convenient* and reasonably *easy to use*, and they must be *dependable*, and *reasonable in cost*. That is quite a large order, but it will be done because that's the way the telephone business operates.

The field of business communications is a perfect case in point. We hear a great deal about "electronic data processing" these days. Let's explore exactly what we are talking about and the problems we are trying to solve. The problem boils down to this: Businessmen everywhere are literally being snowed under by mountains of paper work — forms, reports, surveys, statements, all of them containing hundreds of different types of business data. The big danger is that we could well be-

D. J. White of Fairfield, Ia. visits with Miss Lucille Russell (left) and Vivian Ryden of TELEPHONY.

come so involved in filling out the forms and making reports that we will end up having nothing to report. The challenge facing every businessman is to work out some way of tying together all of the administrative details of running the business, and get out from under the deluge of paper work. Too many businessmen, in other words, are spending entirely too much time reporting what happened yesterday or the day before yesterday, and not spending anywhere near enough time concentrating on what they are doing *today* and planning what they should do *tomorrow*.

Aside from the sheer volume of paper work, another challenge makes the problem even more difficult. And that is the challenge of *speed*. The great emphasis today is on speed in developing a new product, speed in getting that new product to market, speed in calling on your customers faster than the other fellow, speed in cutting down on the production of one model and stepping up the production of another, and so on. To keep up with this kind of situation, the businessman must have a wider variety of business information than he has ever had before, and he must have it faster and in more complete form. He must have data on factory production, manufacturing costs, inventories, shipments, distribution costs, and so on . . . and he must have all of that information *in time to do something about it*. You and I know that the score of last night's ball game may be interesting, but unfortunately we can't do a thing about changing it. It's just so much past history. The situation is the same in business these days, and here we have one of the great opportunities for application of electronics to the telephone business . . . the *communications* business . . . helping the businessman to do a faster and more effective job.

The electronic computer has been described by many people as the brain that makes data processing possible, as the cure-all for everybody's problems. Yet the electronic computer is only a major link in a chain of activities, and no one of these activities runs the entire show. But there is an even more important consideration. The entire data processing system is no better than the data it is processing. There is nothing more useless, for example, than a computer that is being fed inappropriate or inadequate information. Somebody has to get the *right* information from the *right* place to the point where the computers and other equipment can work on it — and that is the job of the communications companies. Tremendous strides have been made in doing this job, but the opportunities for improvement, the opportunities for broader and faster service, are just about limitless.

Left to right: Erling Ringstad of New York City; R. B. Campbell and Frank Cahill, both of Chicago; Leon F. Roberts of Washington, D. C., and R. J. Fegan of Junction City, Kan.

In taking advantage of these opportunities, there are plenty of problems to solve. One is the development of new system improvements — improvements that will tie in more effectively an electronic data processing machine in one location with another machine in a distant location. In other words, we will have to find ways of making these machines practically "talk" to one another, with the ultimate result that one machine in San Francisco, for example, will in effect be right alongside a machine located in New York or London. Of course, this can be done today, but it can't be done well enough, and we will have to find ways of enabling these machines to talk at the rate of several thousand words a minute. When we attain rates of that magnitude, we will have communications systems that will truly revolutionize business management by giving it far more timely and complete information on which to base decisions.

Now let's get even more specific about solving the problem. A growing trend that has many opportunities for the future is the use of regular telephone lines — in contrast to private-wire facilities — for the transmission of business data. A number of companies, particularly some of the larger ones in the manufacturing field, already have private data processing networks which connect widely dispersed facilities with a data processing center, where a wide variety of information is gathered, computed, and summarized, and then reported back to management. But I am talking about the use of regular toll facilities. For example, a branch manager would send a variety of information on his day's operations over the toll lines to a data processing center (perhaps one operated by the telephone company), and the next morning he would receive a full report telling him what had happened. But most important, he would have time to do something about it while the situation was still hot. In fact, it is inevitable that the day will come before very long when toll facilities will be used more for data transmission than for conversation.

There is another major trend which I would like to discuss for a moment, because it injects an entirely new dimension into the telephone system. That trend is "memory" — which, of course, is the ability of exchange equipment to accept and store information for various lengths of time and for various reasons. You can think of any number of direct applications of memory equipment — storing the numbers that are called most often so that the subscriber can put any of them through almost instantaneously, or using a memory device to hold the calling number, the number called, record the length of the call, and calculate the charges. The engineers could cite a hundred other potential applications.

Another field that seems to have an extremely large potential is "slow-scan video," the use of telephone facilities within a given community to transmit and receive images. This is really a type of "business television." Central banks and their branches in various parts of the country already are using this technique to verify signatures, and some companies are using it to transmit maps, technical drawings, and so on. The big advance is that the sender and receiver both have copies and can talk about it.

Educational television is, of course, another growing application. These are only the very earliest beginnings, however, because the use of telephone facilities for image transmission has an unlimited potential.

This potential will be realized because of such relatively new electronic principles as "electroluminescence" which we believe will find increasing application in image transmission because of its great flexibility and relative simplicity of operation. "Electroluminescence" involves the use of a flat panel with a series of conductive and luminescent layers which light up when an electric current is applied.

Through the application of other techniques, these panels can be made to display images transmitted electronically, and we believe this will lead to flat-wall television and flat-panel display of other images.

From the standpoint of operating environment as well as technology, it goes without saying that the field of electronics with literally the biggest potential is space communications. The satellites now circling the earth are the forerunners of a world-wide communications system which, in a few short years, will permit highly reliable person-to-person communications throughout the world. As you know, the trans-oceanic communications we have available today are limited to very-long wave lengths, short-wave radio, and submarine cables. Our scientists envision a network of satellites circling the earth some 2,000 miles out in space, together with space relay stations 22,000 miles above the earth — and this combined system would provide continued long-range point-to-point communications throughout the world, as well as global television and reliable radio-telephone contact with space ships.

This is not some dream that may be 20 or 30 years away. It could easily be a reality by 1970, but we will undoubtedly see it in operation several years before that.

These various opportunities I have mentioned have been just a few of the major applications of electronics to telephony, and we could go into greater detail and talk about the potentials of such scientific fields as solid state electronics and information theory in bringing greater flexibility, lower costs, and higher efficiencies to telephony. Suffice it to say that there are tremendous possibilities for effective use of electronic techniques in the local telephone plant — electronic concentrators are a prime example — just as electronic apparatus has made possible the vast telephone networks in use today.

For the past few moments we have been looking at the technical side of communications, and we have moved our thoughts over quite a distance — from submarine cables to satellites 50 million miles away. But I would like to spend several minutes on the economics of this entire picture. When you get right down to it, all of the developments we have been talking about are truly meaningful only to the extent that they reflect a financially healthy communications business. We all know that technological progress, and the translation of that progress into new and improved service to the public, takes enormous amounts of money — billions of dollars invested in new facilities and equipment. Now, as far as I know, money still doesn't grow on trees. And so the way a telephone company attracts new capital is by earning a fair and adequate return on the capital already invested in the business. This, in turn, enables the company to pay an adequate return to those who have invested their savings in the company, and it also means earning enough to set up a sound depreciation program to replace existing telephone plant as it wears out or becomes obsolete.

Left to right: J. F. Benjamin of Cumberland, Wis.; John Woodward of Bellevue, O., and Pete Ross of Dumas, Ark.

I don't have to tell you that all too many telephone companies these days are being hit from two directions. First, the rate bases they are allowed are too low, and second, the amount they are permitted to earn on that low rate base is also too low. It seems to me that all of us in the telephone business must keep hammering home the fact that a telephone company or any other company, regulated or non-regulated, must have adequate earnings if it is to keep on improving and broadening its service. To put it another way: Adequate earnings will, in the long run, enable a company to provide *better service* at a *lower price* than would otherwise be possible.

Assuring adequate understanding of our earnings problem is a day-after-day job. Certainly, this is no easy job. No one likes an increased cost, even if we assure him over and over again that the cost will be less in the long run. But all of us can do a great deal toward minimizing misunderstandings, which really boil down to lack of communication.

All of us are in the communications business, but that means far more than providing a good communications service. It means doing an equally good job of communicating our objectives, our problems, and our needs to the public, and to the representatives and servants of the public — the federal, state and local governments.

Just how well are we telephone people communicating with the public — what kind of an impression do we make in the minds of the people who, in the final analysis, are in the driver's seat? How many times do we find ourselves on the defensive, communicating only because we have been forced into it, only to find that the public is vitally interested in our story and welcomes what we say? How many times have we found that our so-called opposition isn't opposition at all, but simply are people just like us who don't know our story because we haven't told it to them — and by "story" I don't mean slanted, self-serving information, but *facts*, objective facts that speak for themselves.

In closing, I want to re-emphasize the enormous future opportunities in the communications business. Our population is growing steadily — our industries are expanding — and the distribution and service businesses in our local communities are mushrooming. This confronts us with a two-sided problem — the need for providing more and more telephone service, and the need for providing new types of communications services.

I don't know of any industry that faces bigger challenges than ours—but I also don't know of an industry better able to meet those challenges.

The Imperatives of Public Service

By DANIEL B. CORMAN*

(An REA Conference Address)

OUR INDUSTRY has an obligation to provide acceptable service to the largest possible number of applicants. REA has defined that obligation as area coverage service. Sometimes the question arises, "What is area coverage?" The answer is service to all applicants who are able and willing to pay rates for the desired services which justify the telephone utility to install and maintain the necessary facilities to provide good service.

After the end of World War II, the demand for telephone service in both rural and urban areas was greatly accelerated. All telephone utilities were faced with tremendous problems in their efforts to meet these unprecedented demands. Most small companies were unable to get adequate financing through the usual commercial channels. This problem came to the attention of the Congress of the United States. The matter was discussed in both houses of Congress for quite some time and in October, 1949, the Congress enacted an amendment to the Rural Electrification Act of 1936 authorizing the REA to make loans to telephone companies and cooperatives for rural telephone development. The interest rate was set by statute at 2 per cent per annum.

This law made no stipulation with respect to the equity requirements of borrowers. However, it did require the administrator of REA to make a certification that he believed the loan to be sound and that it would be repaid in full as to principal and interest according to the terms of the loan contract. In order to meet these requirements, the administrator set up certain loan security regulations among which was an equity ranging up to 50 per cent and a first mortgage on all of the property of the borrower. In actual practice, most loans have been made on equity requirements of much less than 50 per cent.

The question sometimes arises, "Is it sound business practice to have a financial structure consisting of more than 50 per cent debt capital?" Insofar as loans by such commercial establishments as insurance companies and trust funds are concerned, I believe that the answer is no. However, where the source of capital is provided by a government agency such as REA, which has a competent staff to supervise the loans, we believe there is ample evidence to justify the practice of using a very high percentage of debt capital.

REA made its first telephone loan in 1950. Through June 30, 1960, the Congress had authorized loan funds to REA in the approximate amount of 679 million dollars. During the same period, REA has approved loans to borrowers in approximately the same amount. Loan funds have been advanced to borrowers in the amount of $501,262,035. These loans have been made to 705 borrowers, of which 211 are cooperatives and 494 are commercial companies. Eighty-nine of the cooperative borrowers have made advance payments amounting to $1,867,437, and 82 commercial companies have made advance payments amounting to $1,408,265, totaling advance payments of $3,275,702. Twelve borrowers are delinquent in payments of principal and interest for 30 days or more. Nine of these delinquent borrowers are cooperatives and three are commercial companies. The total amount delinquent is $285,384 in principal and $30,424 in interest. The fact that this small percentage of borrowers is delinquent does not necessarily signify that the loans have soured. None are in a serious enough condition to justify foreclosure. To me this seems to be a good record.

The loans which have been made to the 207 borrowers are estimated to finance the construction of 356,581 route miles of pole line and to serve 1,371,791 subscribers, of which number 617,516 will receive service for the first time. Literally thousands of exchanges have been converted to dial operation and are providing adequate modern telephone service to their communities. Most of these accomplishments could not have been reached without the assistance of the REA telephone loan program.

No one in the telephone business expects an insurance company or trust fund to make a loan totaling more than 60 per cent of the required capital assets. Insurance companies and trust funds do not have staffs of qualified telephone personnel to determine whether such high debt ratio loans are feasible, nor to supervise the loan after it is made to see that it remains feasible and solvent. REA has set up such an organization and that is the basic reason that the government, acting through REA, can make loans totaling more than 60 per cent of the capital assets without undue risk to the government or the borrower.

Another question with respect to REA loans that is often discussed is the 2 per cent interest rate. It is, of course, a fact that the current cost of money to the government is greater than 2 per cent, yet it is my judgment that the 2 per cent rate of interest on loans for the development of rural telephone service is justifiable.

In the first place, rural telephone development at this time cannot generally

*Mr. Corman is General Manager of South Central Rural Telephone Cooperative Corp., Inc., of Glasgow, Ky.

be undertaken by Independent telephone companies with funds costing in excess of 2 per cent. The average cost of facilities to serve rural people is such that the rates for service would be prohibitive if the cost of the capital exceeded 2 per cent.

The accounting system of the government does not reveal the fringe benefits which the government derives from the circulation of telephone loan funds advanced by REA. All such funds are disbursed by the borrowers soon after they are advanced and immediately start circulating. Each time the money changes hands the Treasury Department derives a substantial part in corporate and personal income taxes which probably exceeds by a considerable amount the loss which the government sustains in making 2 per cent telephone loans.

In addition to these fringe benefits to the Treasury, the standard of living of many people is greatly elevated. In the course of time, these REA telephone borrowers will saturate their communities with adequate telephone service. Their level of income will increase through increased density of subscribers and through education and ability of the subscribers to pay better rates for the service. When that point is reached, some years hence, there will be no further need for the government to make loans for rural telephone development at a rate of interest lower than its current cost of money.

REA has made telephone loans in all states of the union except Connecticut, Delaware, Hawaii and Maryland. Applications for loans have been received from the Virgin Islands and Puerto Rico. Despite the remarkable progress that has been made in the development of rural telephone service since the advent of the REA telephone loan program in 1950, there is still much more to be accomplished.

Left to right: William Stake of Lennox, S. D.; Robert Hyer of Kansas City, Mo.; Harold Ericson of Hector, Minn.; Norman H. McFarlin of Washington, D. C.; Dan B. Corman and B. J. Albany, both of Glasgow, Ky.

A large number of Independent telephone companies still operate manual systems. The manual system is marked for extinction. The cost of operators to switch telephone traffic manually is becoming more and more prohibitive each year. The program of the industry to establish long distance dialing by the operator at the office of origin, and by the subscriber, cannot be made fully effective until every telephone exchange in the nation has been converted to dial operation and equipped for toll dialing. It is going to be most difficult for a large majority of the Independent telephone companies to finance the conversion of their systems to dial operation without use of the REA telephone loan program. Therefore, I consider it expedient, for the industry and for the people, that the Congress make available to REA adequate loan funds at the present rate of 2 per cent per annum until such time as the rural telephone program has reached maturity, and the borrowers are financially able to stand on their own feet and to qualify for commercial loans at the going rate of interest.

At the same time I urge those companies that have not already arranged their finances for converting their manual systems to dial operation to take immediate steps for this progressive move, and if they find it difficult to qualify for adequate commercial loans to complete their dial conversions that they take a good look at the REA telephone loan program as a satisfactory source of meeting their financial requirements. It is my opinion that only a few of the Independent telephone companies will be able to meet their financial requirements through commercial sources. The REA telephone loan program is no longer an experiment, it is well established and its practicability has been proven.

W. A. Ritter of Millstadt, Ill., and his two daughters, Gale (left) and Diana.

Creativity

"Most marvelous and enviable is that fecundity of fancy which can adorn whatever it touches, which can invest naked fact and dry reasoning with unlooked-for beauty, make flowerets bloom even on the brow of the precipice and, when nothing better can be had, can turn the very substance of rock itself into moss and lichens. This faculty is incomparably the most important for the vivid and attractive exhibition of truth to the minds of men."—FULLER.

Industry Cohesion and Cooperation

By HAROLD C. EBAUGH*

(An REA Conference Address)

I SHOULD be much less than frank if I did not tell you that I know there are men in this audience eminently better qualified to speak on this subject than I—men who could bring greater wisdom to you and share with you rich experiences they have encountered through many more years of telephone cooperation than I have.

I would like to share with you some of my thoughts on the assigned subject which will perhaps give you some ideas to take home with you and keep before you in your dealings in this interesting and complex industry in which we work. There are many, many fields of cooperation which we experience and take for granted in our day-to-day operations. There are others which I feel could stand discussion.

I will, but briefly, touch on those on which there is presently full cooperation, and will go into some other phases where perhaps some thought could be given to improvements. I am sure that during this convention we will hear technical papers given on Direct Distance Dialing. It is a subject which certainly calls for joint cooperation of the entire industry; not only from small Independents, such as ours, but from the larger Independents and the Bell System. It has been pointed out many times in trade magazines and other publications that improved transmission quality will be required to meet the criteria of Direct Distance Dialing.

Yet there is a lack of industry cooperation, I believe, in bringing forth all the requirements for this undertaking. Perhaps the biggest stumbling block in this vast network will be with the Independents and the Bell System providing proper maintenance of existing toll lines to meet the stringent requirements for DDD. A great area of cooperation is opening up, the exchange of technical papers, ideas, and personnel for proper maintenance and operation of this complex system. I believe that all companies will experience a shortage of trained personnel as time goes on to meet this challenge.

Another phase of industry cooperation, even though it may not be of great significance to us in the West at the moment, seems to be the challenge of data transmission for the larger industries. This challenge is being met by one of our common carriers—Western Union. In the Aug. 27 issue of *Business Week*, Western Union's operations were discussed in great detail and I am frank to say, and perhaps I am not alone in being unaware of the fact that Western Union has made a phenomenal growth in the last 10 years by expanding its facilities to meet the competition and requirements of the communication industry. I believe that the cooperation, which we as Independents can offer this growing company, will be beneficial to all of us and we most certainly should look to this company for new ideas and ways so we common carriers can participate and benefit by new methods resulting from Western Union's investigations.

It is interesting to read, in this article, of the great expansion in the private wire services offered by this company and to read that over 2,000 companies in the United States; some of the largest, such as U. S. Steel, General Electric, United Airlines and others, have leased communication networks from Western Union and that over 213 banks in 55 cities have been connected with push button switching. Yet, the article says that they got into the private wire system business without much selling effort, for the customers were just waiting for someone to come and sell them this system. Perhaps there has been a lack of cooperation in the industry and perhaps some of us are losing some of our treasured business because we did not have the foresight, or pioneering spirit, or perhaps the capital, to go into such a large scale program. This, in itself, is indeed a challenge and yet cooperation can be obtained, I believe, in this field.

The Dataphone will undoubtedly be as common in the future as our regular telephone communication system is today. When a customer is able to pay for only that time which is utilized by sending of data and reports, it is not hard to visualize that nearly all reports and inventories will be sent by data transmission. Are we in the Independent field ready to cooperate in this program?

In this age we live in, of sonic booms and space communications, many of the Independents are called upon to cooperate with our military personnel in providing communications. Yet, perhaps, this is one of the fields where less cooperation is experienced than we realize. I wonder how many of you have had dealings with the military or other government agencies for communications only to find that the larger companies were the only ones recognized in the telephone industry. I firmly believe that we, in the Independent field, must let the government agencies know we are ready, willing and able to serve all needs of their departments from space electronics to wire communications.

In the Sept. 1, 1960 issue of *Telephone Engineer & Management* (TELEPHONY, Aug. 27) I read of the report

*Mr. Ebaugh is General Manager of Triangle Telephone Cooperative Association, Inc., Havre, Mont.

of PROJECT ECHO which I am sure you are all familiar with and perhaps you have watched this satellite as it whizzed around the world every two hours charting new paths in the communication industry. The article pointed out that it is not improbable that some 50 active satellites spaced in random polar orbit at an altitude of 3,000 miles could provide communication facilities between the United States and all areas of the world.

Stop and realize how this major step forward in space communication would affect all Independents, large or small, because only 6 per cent of the world's population lives in the United States and yet we have over 55 per cent of all the telephones in the world. When these space reflectors or transmitter receiving devices are completed, perhaps within the next 10 years, we will have open to us the other 94 per cent of the world's population and this certainly should stimulate the addition of many new telephones throughout the rest of the world. This project certainly takes great imagination and unlimited supply of capital to make it a reality and yet it will come just as dial telephone and direct distance dialing have become a part of our everyday life.

Let's talk politics a minute. This being an election year, we certainly should bring forth all the cooperation we can in seeing that our industry is well protected by the election of candidates to high offices who recognize the value of adequate communication systems, and will lend their support and dignity to the men who will work for us in the furtherance of this vital and necessary free enterprise system.

I believe that many of us who have dealt with the military are quite concerned with the recent Air Force announcement of its decision in the Minuteman program in declaring the communication circuits on the intersite cabling to be an integral part of the weapons program and have excluded the common carriers from competing on these installations on a leased basis.

I believe this one factor is one of the biggest blows to the industry in these United States and goes to show how far the United States Government will go in government ownership where communication facilities could be obtained from the industry on a leased basis. I urge you to investigate all these government projects and I am sure, beyond a shadow of a doubt, that we in the communication industry, can furnish, install and operate all the requirements which are for national security at a lower initial cost and by far a more economical operation and maintenance contract. If, in any field of the communication industry, there is a lack at this time of cooperation I believe it certainly appears today in the government's attitude of government ownership where leased communications can be provided.

Left to right: Mrs. J. A. McVeigh of St. Thomas, Ontario, Canada; Mrs. M. Huge of Lorain, O., and Mrs. G. I. Phillips of St. Thomas, Ontario.

With cooperation, I know that many of you are participating in the long line communications, the installation of heavy radar sites, Texas towers, military base installations and others which, in my humble opinion, are all part of our national security and are done so on a leased basis. We must urge and insist on full cooperation with the military and government agencies to maintain this business for the industry.

I believe it would be most helpful if we could spend some time between now and election day in visiting with our legislative people in our home communities, and with the candidates to be elected to public service commissions, local city councils and county commissioners for they certainly will play a large part in setting the policies and regulations and rates which we must live with within our franchised areas. I believe it is a good idea to ask for their cooperation and to insist that they become well informed on these subjects for any legislation detrimental to the communication industry should certainly be explained in great detail to these candidates, not only on the local level but on the national level.

Our association has been working very hard on the 750-station exemption which is an example of how much work must be done with the legislative people to maintain the things which we feel are necessary for our existence.

Let me urge you to become an active member of all trade associations that you feel you can afford to belong to. Your USITA has proven over the many years of experience how valuable a good trade organization is to the industry. Many of you REA borrowers are well aware of the outstanding job done this past year by the National REA Telephone Borrowers Committee, in working with the commercial REA borrowers in gathering information to present to Congress for adequate appropriations and low interest rates for the REA program.

Many of the cooperative borrowers here today recognize the advantage of cooperating with the National Rural Telephone Cooperative Association which likewise has done an outstanding job in presenting the cooperative needs to Congress. There are other trade organizations which many of us belong to such as our state associations and regional associations. All of these tend to bring forth experiences of other like companies so that we can grow in this communication industry.

In closing, I would like to say that, in the few short years that I have been connected with the telephone industry, I have found it to be one of the best cooperating enterprises in America today. Yet, in going through the history and recorded documents on file in our national office, I find that our problems are somewhat the same as they were 50 years ago, but are just on a little more complex and on a little higher plane. We must have cooperation from the manufacturers, distributors, suppliers, contractors, engineers, union leaders, our employes, congressional delegates, and our own company policies so that our ultimate subscriber will benefit from the lowest possible rate and the highest quality service that we in the telephone industry are able to provide.

So you can see that cohesion, which means "sticking together" and cooperation, which means "working jointly" have great significance to us today and I am sure that as we go into the balance of this convention we will all benefit from the things we learn here together.

Some Pointers in Achieving Good Management

By J. K. GALLOWAY*

(An REA Conference Address)

I HAVE BEEN asked to make some suggestions as to how to improve management. We all have need for good management, large or small companies. Perhaps the small companies have the greatest need, because it is through good management that they grow into big companies. Basically management is the accomplishing of a planned objective through the use of other people. All of you are managers, but how many of you are good managers. The question is how much can you improve your management. Let's see how.

In order to illustrate, I propose that in this missile age we set the moon as our objective and call it "good management," then build a missile to get us there. So here is our target, and we will call it *good management*. With good management we get more profits, which we can all use, we give good telephone service and we get expandability. We all understand *Profits and Good Service*, but let me illustrate expandability.

Suppose that when you get back to your office you find that the Air Force is proposing the installation of a missile complex in your service area. Good planning would require that you have explored this possibility and that you have a plan to provide such service. If you have a plan that can be implemented you are a good manager. Suppose you get word that an industrial plant is to be built in your service area which when completed will employ some 1,000 people. This could come as quite a jolt. If you have a plan to obtain the money and a plan to design and construct the required facilities, you are a good manager. If you don't have a plan, you should start developing one now.

We can then conclude that planning is one of the basic principles of good management. So let's call the flame of our missile *planning*. The flame of the missile provides the thrust to get the missile off the ground. Now let us talk about planning for a minute. In addition to the illustrations I have just given you, we also need a stated company policy—a basic policy. That policy should state in general terms what your company proposes to accomplish. For example, your company is organized to furnish good telephone service —good telephone service at the least possible cost to the public—but there is some more—and we add commensurate with sound financial policy. Now we have as a first objective of the company—to offer the public the most modern and efficient telephone service possible, commensurate with sound financial principles. You gentlemen are managers and can develop this to suit your individual needs. There is attached to an extract of these remarks a typical set of company objectives which make up company policy. This company policy should be given to all your people and a detailed explanation given each employe so that it can be understood. Planning also facilitates decision making and develops creativeness, all within the framework of company policy.

After the missile is off the ground, the first stage takes over and propels it further toward our objective. So let's call this first stage of our missile *organization*. Remember now you are organizing people, and in order to get people to do what you want them to do, you must tell them. If you have some hazy idea what you want to accomplish, you can hardly tell your people what to do or when to do it. In organizing people you must tell them clearly what their duties are and authorize them to exercise the authority necessary for them to complete the assignment. So a set of duties and responsibilities for each of your people is necessary. These should be in writing. I will illustrate.

Suppose you instruct your plant superintendent to maintain good service. One of your customers comes to you and complains his telephone has been out of order over a week. You call your plant manager and say, "Jim, what happened to our subscriber's service?" He says, "That was cable trouble, and I couldn't get the cable splicer on the job sooner than yesterday. He was working on a new cable we are installing." You say, "Jim, I told you to do the necessary to get that cable restored to service." Jim says, "I didn't understand that."

The point is if you have written duties and responsibilities, you can call Jim and say, "Jim, why haven't you been doing the job assigned? Here it is in your duties and responsibilities, you are responsible for this." People forget important things about their jobs, so as the manager it is your responsibility to have those duties in writing so you and Jim can refer to them and see what is required. This is important, and will be of great help to you in being a good manager. You should have a company organization plan showing who reports to who and also showing the lines of authority.

In order to have your organization function, you must have a training program. There are many sources of training material of a technical nature and of a general nature. This is im-

*Mr. Galloway is President of The Winter Park (Fla.) Telephone Co.

portant—remember we must train our people so they can accept more responsibility, so they can act with more authority, so we can pay them more money. There is an art in supervising people. One of the reasons we have unions is because we have not supervised our people properly. Let me illustrate.

The day has gone when we can call a good installer in and say, "John, you are a good installer. You are now promoted to supervisor of installation. Put your hat on the other side of your head and act like a supervisor." Poor John. Sure, he can install telephones himself, but he now is a manager. He must install telephones through other people. You haven't been fair to him when you don't give him training in supervision. I have seen lots of people that were experts, but when made supervisors they fell flat on their faces. Why? They don't know how to teach and supervise other people.

To illustrate, we had a man who was made testboard supervisor. He struggled for a long time. He was unhappy in his job, and the section was not performing. In short, the job was not being done. We sent him to two schools—one on supervision and one on job methods. He was a good student, he learned a lot—our initial selection was good because he had the aptitudes for the job assigned. Within weeks he had his section completely organized. The job was being done. He was happy in his work. In fact, he was running his job—his job was no longer running him.

For you managers, the USITA has an excellent Management Development Program at the University of Kansas. Every company represented here should see that one of your top management people attend. The cost is small compared to the benefits you will receive, and the benefits will be useful for years to come. This display explains the course and will be in the hall tomorrow. Read it carefully. In addition, the USITA sponsors an engineering course at Michigan State which is available to your technical people. Next year there will also be a one-day seminar on merchandising at Michigan State. The REA Regional Seminars on Plant, Commercial and Accounting are excellent. Your people should attend.

To assist you, there is, at the end of this paper, a list of training material available to you. Read it and make some of these courses available to your people.

Left to right: R. E. Brooks of Florence, Ky.; R. E. Hornacek and Paul O. Cohrs, both of Chicago, Ill.; L. T. Utz of Florence, and R. V. Achatz of Aurora, Ind.

Left to right: A. O. Sander, Shawano, Wis.; Mrs. Max Robinson of Leaf River, Ill., and Mr. Robinson; James Powell of San Juan, Puerto Rico, and A. Van Walleghem, St. Thomas, Virgin Islands.

The flame and first stage of our missile get us on the way, but there is a second stage which takes us high in the stratosphere. For our good management missile we will call the second stage *motivation*. This is getting other people to do the things that we want them to do. All of you have read Dale Carnegie's book on "How to Win Friends and Influence People." This is a good starting place. We are not like the Russians. We can't give orders, and if they are not carried out send the culprit to Siberia. We can stop their pay, but that is expensive for us and for the culprit.

Let's recognize the fact that most of our people want to do a good job. Our job is to create a desire in our people to learn more so we can pay them more. That is the place to start. Now let's tell him what is going on in the company. To illustrate, most line crew foremen are not very good supervisors, because we have not taught them to be. If a line crew foreman would stop for five or 10 minutes each morning and outline for his men the jobs to be accomplished during the day, and give a little information as to what would be accomplished for the company, his crew would work harder and do a better job. Try it and see how it works.

Communication is a great thing. Most of us dislike work, but we have to work to eat. But if we know what we are accomplishing by our efforts, we will work with more enthusiasm, do a better job and get more done. Don't forget, as managers we must inspire our people to do the job that must

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be done. In motivating people, we must be fair and honest in our dealings with our people. Integrity is honored and respected by all our people.

Another tool of management is employe evaluation. All our people want to know how they are doing. Many of us find it difficult to correct and at the same time explain how. One of the reasons that is so difficult is that we must know how before we can explain how. You will find that an organized plan for regular evaluation of your people will greatly improve your whole organization. This is done by you for the supervisors and by the supervisors for each of their people. Tell them where they are good and tell them where they can improve.

Let's remember that by reviewing company operations for your department heads, and having your department heads review company operations with your supervisors, and so on, to inform your least employe of company problems and solutions, you will create a management team that will surprise you.

Our management missile is now on its way, but the purpose of this shot is to hit the target—*good management.* The nose cone on our real missile has all the instruments, so we will call the nose cone of our management missile *control,* to represent the control you as managers must use in the operation of your business. You must follow the REA construction standards, a control imposed on you for your benefit by REA. You must maintain good accounting records. Those records are useful to you on a monthly basis and should be available to you each month for you to see how you are doing and how you can improve the efficiency of your operation.

Do you prepare an operating budget each year showing your estimated income and expenses and compare it each month to see how you are doing? This could help you immensely in the control you must use in your operation. Do you prepare a capital expenditure budget for the year ahead and compare that budget each month with actual expenditures? This can help keep your cash position so you can be assured of maintaining your credit. Compare your operations on a per-station basis with the operations of other companies. This can tell you how you are doing as a manager, and will point up ways you can be a better manager.

Each of you should report your operations to our Washington office of the USITA so that you can be included in our Statistical Manual. The information there can be easily converted to a per-station basis, and you can make a wide variety of comparisons. This is important and will be very helpful.

Our missiles that are fired from Cape Canaveral have fins which furnish strength and help keep the missile together as well as to stabilize it. So we will call the stabilizers on our management missile *coordination,* because it is through coordination that we can bring our management missile to its target—*good management.* We have made plans, so we know where we are going, we know our objective, we have our organization—so we know who reports to whom, and who is to do what. We have established communication within our organization so that our people know why they are doing their job; in short, our people are working together.

You as the manager must see that this coordination is perfected every day. Test it. How many times does your installer have to wait for a pair assignment, or maybe install the telephone and it will not work until the next day because of lack of central office coordination? Can your commercial office personnel tell the applicant for service that your phone will be installed at 10 tomorrow? Or do you tell him, "We will install your telephone next week?" These are questions you can ask yourself—you the manager—and see how well managed your company is—how good a job you are doing. Don't forget, and this is very important—all you have to sell is service.

By improving your management ability you can run your business, and not have your business run you. You can make more money and enjoy it. Instead of running your business by the seat of your pants, manage it!

Basic Company Operating Policy

(1) To offer the public the most modern and efficient telephone service possible commensurate with sound financial principles.

(2) To provide telephone facilities on a ready-to-serve basis within the limits of reasonable forecasting, engineering and sound financial principles.

(3) To maintain as reliable a service as possible, commensurate with the public need and the ability of the public to pay for such service.

(4) To have authorized rates and charges for telephone service which will make such service available to the public at the lowest possible cost in keeping with sound financial principles.

(5) To maintain all records of the company, particularly financial records, by uniform standards as prescribed by the Florida Railroad and Public Utilities Commission through the application of efficient and modern practices and in such detail as will enable officials of the company, its stockholders and the public where required, to be adequately informed as to the company operations.

(6) To be ever mindful of the fact that the company is a public service corporation, and that no favoritism can be shown to any individual or corporation in furnishing telephone service, except where the public interest dictates otherwise.

(7) To insure maintenance of company credit, the company will undertake no project until its complete cost is determined, funds are available and the income from such project will warrant the investment.

(8) To insure company employes the best possible working conditions, maximum security and an adequate living wage compatible with area living conditions.

(9) To maintain adequate training facilities that each employe may have opportunity for self improvement and advancement.

(10) To promote employes from within the ranks of the company whenever possible.

(11) To encourage the participation of company personnel in those community projects which have for their purpose the economic, social, religious and cultural advancement of the community.

* * * *

Supervisory Training Courses Available From State of Florida Department of Education

(Contact: Dr. Charles R. Crumpton, State Coordinator, Supervisory Training)

(1) Harvard University Reading Course.
(2) Safety Management for Foremen.
(3) Human Factors in Safety.
(4) Psychology of Safety in Supervision.
(5) Supervisory Leadership Training in Fundamentals of Supervision.
(6) Instructor Training for Supervisory Personnel.
(7) Human Relations Training for Supervisory Personnel.
(8) Effective Speaking for Supervisory Personnel.
(9) Conference Leadership Training for Supervisory Personnel.
(10) Job Instructor Training.
(11) Human Relations in Industry.
(12) Human Relations in Hospitals.
(13) Improving Job Methods.
(14) The Supervisor As An Instructor.
(15) Problems in Handling People.
(16) The Supervisors' Part In Safety.
(17) Principles of Organization and Management.
(18) Management Techniques for Foremen.
(19) Practical Supervision.
(20) The Techniques of Supervision.
(21) Supervising People.
(22) Effective Supervision.
(23) Elements of Supervision.
(24) Management Training, Cases and Principles.
(25) Motivation and Resistance to Change.
(26) Psychology in Industry.
(27) Human Relations in Supervision.
(28) Human Relation in Industry.
(29) Better Business Communications.
(30) Handling Barriers in Communications.
(31) How to Talk More Effectively.
(32) Communication in Management.
(33) Psychology of Industrial Relations.
(34) Human Relations in Action.
(35) Influencing Employee Behavior.
(36) Principles of Management.
(37) Top Management Organization and Control.
(38) Human Behavior in Industry.
(39) Conference Leadership.
(40) Economics, Principles and Applications.
(41) Basics of Supervision.
(42) Job Instruction Techniques.
(43) Group Discussion Techniques.
(44) Leadership Training.
(45) Effective Speaking.
(46) Letter Writing.
(47) Speed Reading.
(48) Basic Economics.
(49) Basic Sales.
(50) Management Courses for Air Force Supervisors, Civilian and Military.
(51) Introduction to Supervision.
(52) Principles of Work Management.
(53) Supervisory Development Program.
(54) Techniques of Supervising People.

(55) Job Relations Training Manual.
(56) Job Instruction Training Manual.
(57) Job Methods Training.
(58) Program Development.
(59) Using Job Instruction Training.
(60) Union Job Relations Training Manual.
(61) Training Course in Material Handling.
(62) Industrial First Aid Training.
(63) Communications in Business and Industry.
(64) Conference Leadership Training.
(65) Economics Training.
(66) Effective Job Organization.
(67) Problems in Business Management.
(68) Waste Reduction.
(69) Machinery Manufacturing Cost Accounting.
(70) Fundamentals of Management.
(71) Communication.
(72) Communications of Ideas and Ideals.
(73) Human Relations in Supervision, Parts A and B.
(74) Supervisory Problems in the Plant.
(75) Case Problems in Business and Industrial Management.
(76) Secret of Job Success.
(77) Secrets of Successful Leadership.
(78) Human Relations Cases.
(79) Cases on Human Relations in Business.
(80) Cases on Human Relations in Management.
(81) Conference Leadership.
(82) Job Relations Training—Case Studies.
(83) Principles of Human Relations.
(84) Conference Leadership in Business and Industry.
(85) Departmental Personnel Procedures.
(86) Examining the Will to Work.
(87) Straight from the Horse's Mouth.
(88) Your Attitude Is Showing.
(89) Guide for Conference Leadership, Supervisory Topics.
(90) Guide for Conference Leadership, Safety Topics.
(91) Case Problems in Personnel Management.
(92) Filmstrips Management and Supervisory Training Programs.
(93) Charts for Economics Training.
(94) Management and Supervisory Training Charts.
(95) Guide for Conference Leadership.
(96) Successful Conference and Discussion Techniques.
(97) How to Be a Successful Leader.
(98) Management and the Worker.
(99) Developing Management Ability.
(100) Developing People in Industry.
(101) Psychology for Life Adjustment.
(102) Sizing Up People.
(103) How Our Business System Operates.
(104) Guide for Management Trainers.
(105) Management Training for Small Businesses.
(106) The Management Process.
(107) Program for Supervisors Development in the Army Establishment.
(108) Guide for Supervisors Development in the Department of the Army.
(109) Supervisors Guide to Job Instruction.
(110) Planned Promotion Programs.
(111) Modification of Jobs for Better Utilization of Manpower.
(112) Promoting the Will to Work.
(113) Performance, Appraisal and You.
(114) Guide for Conference Leadership.
(115) Supervisory Development Program.
(116) Discussion Leadership.
(117) New Foreman Training Plan.
(118) Selection and Training of New Foremen.
(119) Management Development Programs for Executives and Supervisors and a Manufacturing Division.
(120) The Responsibility of the Training Supervisor.
(121) Induction Training.
(122) Production Training.
(123) Preparation of Training Course Outlines.
(124) How to Select New Supervisors.
(125) Techniques of Day-To-Day Supervisor.
(126) Job Methods for Supervisory Personnel.
(127) Extemporaneous Talk for Industrial Supervisors.
(128) Business Letter Writing for Industrial Supervisors.
(129) Supervisory Development Program.

Supplementary material including Instructors Manual, pass-out sheets, and, in some cases, films, is available with the majority of the above training programs.

A manual giving a brief description of each of these courses will be published some time in the first quarter of 1961.

Requests for any of this material should be directed to Dr. Charles R. Crumpton, State Coordinator of Supervisory Training, Department of Vocational and Adult Education, Tallahassee, Florida.

Left to right: Serge Greenefége, of New York City; W. R. Crotser of Cleveland, O.; C. L. Lineberger of Chicago, Ill., and W. G. Hamm of Cleveland.

Similar extensive adult training programs are in effect in a number of other states. Principally, the states of Ohio and Texas have excellent programs which have been in operation for a number of years. Information and material can be obtained normally from these and other states usually by contacting the agencies responsible for Public Adult Education. Although it is not true in all cases, the State Departments of Education generally are the agencies responsible for handling of this type of program.

* * * *

Sources of Training Information

(1) Bibliography for Supervisory and Leadership Training. (This can be secured from Doctor Charles R. Crumpton, State Coordinator of Supervisory Training, Department of Vocational and Adult Education, Tallahassee, Florida.

(2) Educational material, films and books on Supervisory and Management Training may be obtained from such publishing companies as The McGraw-Hill Book Co., Inc., 1330 West 42nd St., New York 36, N. Y.

(3) The Dartnell Corp., 4660 Ravenswood Ave., Chicago, Ill.

(4) Prentice-Hall, Inc., Englewood Cliffs, N. J.

(5) BNA, Inc., 1231 24th St., N.W., Washington 7, D.C.

(6) The National Foremen's Institute, Inc., Deepriver, Conn.

(7) The International Correspondence School, Scranton 15, Pa.

(8) Alexander Hamilton Institute, Inc., 71 West 23rd St., New York 10, N. Y.

(9) The American Management Association, Inc., 1515 Broadway, New York 36, N. Y.

(10) The various Bell System companies and the General Telephone & Electronics Corp.

(11) Various business magazines, including those which pertain directly to the telephone industry as well as other industries. Examples include: TELEPHONY, Telephone Engineering and Management, Nation's Business, United States News and World Report, Business Week, etc.

(12) Trade associations including, The American Society of Safety Engineers, The American Society of Training Directors, Personnel Associations, National Secretaries Association, Management and Industrial Groups and Associations, etc.

(13) The Southern Technical Institute, Chamblee, Ga. (This school is a unit of the Engineering Extension Division of Georgia Institute of Technology and provides well trained telephone central office, traffic and plant technicians and engineers.)

(14) The United States Independent Telephone Association Management Development Program for Independent Telephone Executives, Kansas University, Lawrence, Kan.

(15) Various state universities and colleges in your company's area. This includes junior colleges, county vocational schools, high schools and privately endowed colleges.

(16) The Public Utility Executive Program held annually at the University of Michigan, School of Business Administration.

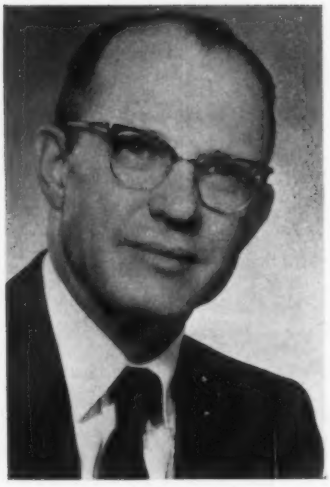
(17) The Telephone Engineering Conference held annually at Michigan State University, East Lansing, Mich.

(18) Management Conferences held at Cornell University, Ithaca, N. Y.

(19) The Public Utility Reports Guide (a correspondence home study Course for Utility Executives), Public Utilities Reports, 332 Pennsylvania Bldg., Washington 4, D.C.

(20) Superintendent of Documents, Washington 25, D.C.

(21) A great deal of valuable training information and training aids can be secured through the government, by simply requesting to be placed on the mailing list of State Announcement of Government Publications. An example of training programs that can be secured from the government includes the Management Course for Air Force Supervisors, which includes training outlines on management and supervisory problems and their solutions.



Put Them on the Line

By DAVID A. HAMIL*

(An REA Conference Address)

IF I TELL YOU there are still some households in rural areas that do not have telephones, there will be no ripple of surprise in this meeting room. And if I say that we want to make subscribers out of these people—put them on the line—there will be no argument, I am sure.

The REA rural telephone program has come a long way in the 10—almost 11 years—since Congress authorized REA to make telephone loans.

During most of this time, our efforts were concentrated on loans and system construction. Now we are turning more time and attention to emphasis on good management and sound operations. This was the expected sequence, the normal pattern, for development of the rural telephone program. First, you get the money and build the system. Then, when you have it completed, your maximum effort is put into getting the best possible use out of it. Construction and operation are never separate, exclusive steps. Many of you are operating a modern dial system now and still building for expanding service. I think this may be the prevailing pattern for some time to come. It is about this stage of the rural telephone program that I want to share some thoughts with you today.

I think most of us in this room are aware of how far we have come in a short period of time. It was only 10 years ago that the U. S. Census figures showed just 38.2 per cent of this nation's farms with telephones of any kind. Today—just a single decade later—our best estimates indicate that close to 65 per cent of the farms have telephones—and a much higher percentage of that service is now modern dial.

This kind of progress is a credit to the entire telephone industry. It reflects a good job being done by REA borrowers, by other Independent companies, and by Bell companies. And in addition, there has been a great advance in service as a result of various segments of the industry working in close harmony.

REA's share in improving and extending telephone service in rural areas has been more than two-thirds of a billion dollars in long-term loans to 711 Independent companies and cooperatives. The actual figure stood at $705,600,000 on Sept. 1. Of this amount, more than half a billion—$519,900,000—was actually advanced to borrowers for construction and other authorized purposes.

Now, what have these companies and cooperatives done with this much financing? Well, they built nearly 227,000 miles of outside plant. While most of this is conventional pole line, an increasing amount is going underground in buried wire and cable. A very little of it is the new long span. Subscriber carrier and microwave make up a small but significant part of the plant of REA borrowers.

At the same time, 583 systems had placed in service a total of 2,425 new dial exchanges financed by REA. Most of these were in strictly rural territory which had been without telephones or accustomed to obsolete magneto equipment.

How many people are using these phones? REA loans made to date will bring modern dial service to 1,424,000 subscribers. Close to half of these will get telephones for the first time. Our figures on telephones actually in service are not quite so recent, because they come from periodical reports which borrowers send in to REA, but on Dec. 31, 1959, 1,059,456 telephones were reported in service. These included 122,119 business main stations and 824,291 residence main stations.

It is significant that the program of loans, plant construction, and installation of station equipment has picked up speed as it moved along.

On Jan. 1, 1953, for instance, only $106,500,718 in telephone loans had been approved, and less than half of that—$51,951,000—had been advanced to borrowers for their use. This is about 15 per cent of the total loans in what was roughly a little under a third of REA's telephone lending history. Some 85 per cent has been made under the present administration.

Similarly, in construction, only 21 REA-financed telephone systems had cut over to dial a total of 26 exchanges by Jan. 1, 1953. Outside plant completed by that date was 1,075 miles. The bulk of the construction was accomplished in the last 7½ years, and the pace continues to quicken.

We think part of the explanation for this amazing progress is due to more efficient procedures adopted by REA. We now have two loan programs — electric and telephone — being carried on by the same sized staff that used to handle the electric program alone. We have streamlined lending procedures and reduced the paper work which in the early days complicated construction activities. These changes have enabled borrowers to save time and money and to get on a sound operating basis just that much sooner.

We are proud of the strong financial

*Mr. Hamil is Administrator of the Rural Electrification Administration, Washington, D.C.

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position being attained by the great majority of REA-financed telephone organizations. Their improvement in debt service payments is unmistakable evidence that they have been successful in finding ways to bring quality service to rural people on a financially feasible basis.

Since Jan. 1, 1953, REA telephone borrowers have repaid more than 17.5 million dollars in principal; they have paid almost 16 million dollars in interest; and they have built a cushion of credit in advance payments of nearly 3.5 million dollars. The number of borrowers which were behind schedule in payments has dropped steadily until now there are only 13 in this category.

We can see from this that REA borrowers are doing well on a long-run basis, despite the relatively high cost per subscriber of providing modern dial telephone service on farms and in scattered rural communities.

At the outset, REA's policy of area-wide coverage was scrutinized with a critical eye by many people in the industry. It took a while for understanding that the key word was "practicable." The policy statement is worth repeating, because we hold it every bit as valid today as we did when it was first set forth in the enacting clause of the rural telephone legislation:

"It is hereby declared to be the policy of the Congress that adequate telephone service be made generally available in rural areas through the improvement and expansion of existing telephone facilities and the construction and operation of such additional facilities as are required to assure the availability of adequate telephone service to the widest *practicable* (there I underscore the word "practicable") number of rural users of such service."

In applying the policy, we require borrowers to provide service to the extent that can be fully justified in terms of costs and revenues. Remote and isolated subscribers and very thin areas are deleted from subscriber surveys and become subject to the line extension policy to be established as a part of the borrower's tariff after construction of the initial system has been completed.

What we have been saying, in other words, is this: "Build out into the rural areas and put subscribers on the line—to the extent that can be fully justified by a careful study of anticipated costs and revenues."

I think there are sound businessmen within the telephone industry who have been a little surprised to find how much they could afford to expand into rural territory with modern dial service. The long-term financing provided through REA's loans has certainly been one factor in making it possible for you to put rural subscribers on the lines in greatly increasing numbers.

Left to right: Mr. and Mrs. Howard Ellis of Haviland, Kan.; Mr. and Mrs. Charles W. Ellis of Conway Springs, Kan., and Mr. and Mrs. Ross K. Vernon of Sioux Center, Ia.

Another has been the rapid technological development in telecommunications. REA has cooperated in many of the improvements in methods, equipment, and materials that have helped hold down construction and operating costs for rural service. Borrower systems have contributed to this progress through field testing of buried plant, long-span construction, subscriber carrier, joint use of poles, and many other possibilities for savings or improved service.

Better toll contracts have been a help to many Independent companies and cooperatives. Consolidations, in some places, have combined small, weak systems into feasible enterprises. Improved management methods have widened margins for still other telephone operations.

The attitude of subscribers and potential subscribers toward rates and service can turn out to be a surprisingly strong factor in building a profitable rural telephone business. Some of you already have discovered this and are benefiting by it. There had been some feeling that a great many farm families, accustomed to the 75 cents-a-month magneto switcher line, would not be willing to pay rates of $5.00 or $7.00 for dial service.

Well, these apprehensions happily turned out to be groundless. In some sparsely populated locations, farmers and ranchers may pay as high as $10 a month for multi-party rural service. When you add to this the charges for toll calls and then collect a 10 per cent Federal excise tax on the whole bill, it is a pretty big chunk of change. And it is a clear indication of the value that some subscribers place on good telephone service today.

We have seen rates climbing to levels that assure reasonable margins. And the percentage of farms with telephones has been climbing faster than ever before in the industry's experience. Some borrowers have been more fortunate than others. We have records of a very few systems from the early days of the REA program which built for more subscribers than they were able to obtain. More typical, however, is the company or cooperative which passes its five-year subscriber figure in 3½ or four years.

There are several reasons for this phenomenon beyond the happy realization that telephones for farmers are a great thing. Which of them apply to your own operations?

One is the situation in which a town or city spills over in a direction not anticipated, possibly following the path of a new highway. Another is the fortunate circumstance of a new industry or a military installation locating in the area, and bringing in additional population.

This is bonus growth. You can't count on it in advance, but you can be prepared for it. This kind of growth can be absorbed in an orderly manner, and you can put the new subscribers on the line promptly and profitably, if the basic system was built with an eye to some flexibility and with the guidance of long-range planning — and if there is a source for additional financ-

ing. REA stands ready to serve you in this.

We urge borrowers and applicants to plan ahead and to provide the kind of space, staff, and equipment which will make a rapid expansion easy if it comes. And REA is on hand to provide your needs for borrowed funds without a lot of red tape.

Some of our borrowers have surpassed their five-year subscriber goals ahead of time by sheer hard work and intelligent management. Dependable service and good subscriber relations are the key ingredients.

Where there is slack line fill, subscribers may have to be signed up the hard way. Certainly, no manager is going to rest on the presumption that if rural people want telephone service they will come to the office and ask for it. But there are managers who become so absorbed in the construction phase of expansion and improvement, that they postpone the direct solicitation of new subscribers.

We have found most managers alert to the advantages of full-scale and continuous sign-up efforts. Among the things they do are these:

(1) They train their linemen, installers, and office help to be part of the promotional team that puts new subscribers on the line. Employes who are in constant touch with the public come to represent the company in a very personal way. Employes need to know this and to understand how to convert this relationship into new subscribers, the sale of more services, and company good-will.

(2) They take time out of their daily schedule to knock on doors and to write personal follow-up letters. The manager of a small system has the advantage of meeting non-subscribers face to face with a friendly, neighborly interest in seeing that they have good service.

Every new subscriber you connect makes your service worth more to that person's neighbors—to every other subscriber on your system, as a matter of fact. Put them on the line!

Now that the construction phase of rural telephony is so well along, I think it high time to turn more of our attention to the commercial activities and subscriber relations which are so important to a well-managed telephone enterprise. There are examples all around us to prove what can be done to increase margins and—what is most important in terms of REA's responsibility under the rural telephone legislation—to get adequate telephone service to more people in rural areas.

I am glad to see borrowers adopting a definition of "adequate" service that means personalized service designed for the needs of the particular subscriber. Along with the need to sign up new people and put them on the line, there is the opportunity to sell the many new services that broaden the subscriber's use of telephony. These include such revenue-raisers as: Extension telephones, extension bells, yard gongs, telephones in color and in new designs to fit particular household or farm needs. Intercom systems with key sets can be pushed on the basis that farming is a business. There is already a widespread rural demand for upgraded service. Perhaps someday we shall have to begin thinking in terms of private line telephones for farm businesses as we do for commercial establishments in town.

R. C. Reno, TELEPHONY's editor and Mrs. Kay G. Adair of Dumas, Ark.

In any event, we are past the time when the telephone is regarded as a luxury. And we should be ready now to sell telephone *service*, instead of just putting a conventional black telephone in the center of the house.

Every extension you install provides better service. The average ratio of extension telephones to main stations on the lines of REA borrowers is too low. The percentage of extensions was about 7 per cent in 1957, and increased to about 9.2 per cent in 1959, but that is still way below what larger companies average in suburban areas. It is precisely the farms that have greatest need for extensions. A level of perhaps 18 to 20 per cent is within reach. Every one of you is an experienced enough manager to know what a doubling of extension rentals would do for return on your plant investment.

This is just one example of what you can do. If REA borrowers could exchange views on the subject of subscriber sign-up and service sales know-how, it seems to me a lot of valuable ideas and experiences could be put to wider use. Both the REA and the USITA, as well as the state telephone associations, could give such a program a big boost.

Now I want to talk for a moment about something broader in scope than good sales techniques. This is, after all, but one aspect of management's job. It is important right now, but it is part of a whole concept of management responsibility that is vital to successful operation and continued good service.

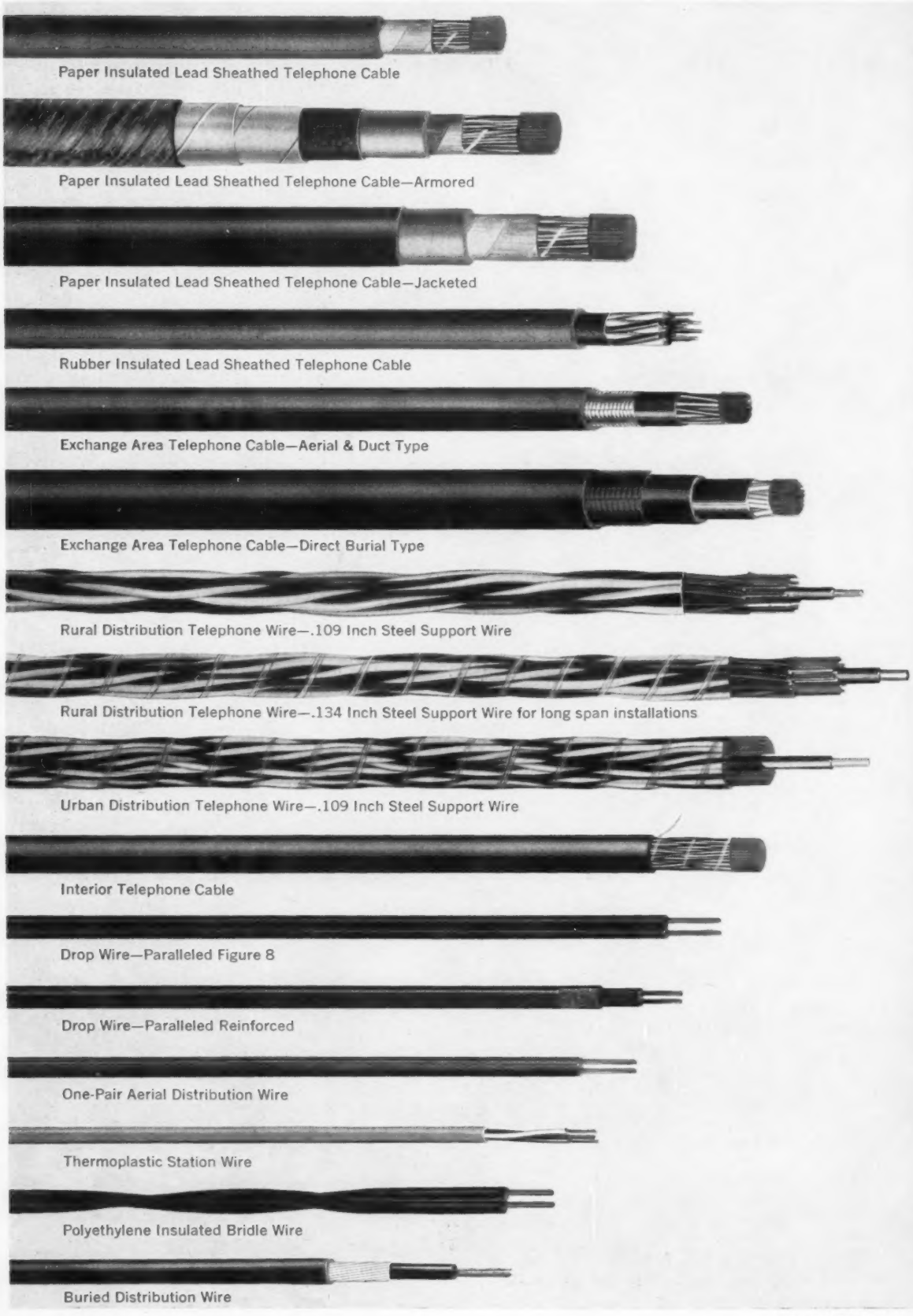
Several months ago—in June—REA sent to all telephone borrowers a new policy bulletin entitled, "Financial Planning by Rural Telephone Systems." It sets forth REA's strong recommendation that telephone organizations look ahead to their long-range requirements and plans, as a matter of basic policy.

Financial planning includes a forecast of operations three to five years ahead, taking into consideration such factors as subscriber development, and capital requirements for system improvements and additions. It includes the development of an annual operating budget, and a determination of funds required for all corporate purposes and the sources of those funds.

We hope you will continue to invest general funds in plant to the extent dictated by prudent management policy and the need for a systematic growth of ownership equity.

We believe that as you grow in financial soundness, you should make advance payments on your REA loans as a cushion of credit. Every business has to keep on hand enough money for working capital, replacement, and emergencies. Dollars not being used for day-to-day expenditures cannot be stacked on the closet shelf. For borrowers who want to place funds where they can be recovered on short notice, there are the new REA 2 per cent Treasury Bonds. Already more than 5 million dollars have been invested in these bonds, mostly by the electric co-ops, but some by telephone borrowers.

Long-range planning will help you put your operations on a sound financial base and in a position to furnish maximum service to your present subscribers and to potential subscribers. It is important to go after those potential subscribers. As I look at the rural telephone program today, I think the greatest immediate needs are financial planning and a drive to get additional subscribers. Today is the time to plan for tomorrow's revenues. This is the year to knock on the doors and sell adequate service.



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Exchange Area Telephone Cable—Direct Burial Type

Rural Distribution Telephone Wire—.109 Inch Steel Support Wire

Rural Distribution Telephone Wire—.134 Inch Steel Support Wire for long span installations

Urban Distribution Telephone Wire—.109 Inch Steel Support Wire

Interior Telephone Cable

Drop Wire—Paralleled Figure 8

Drop Wire—Paralleled Reinforced

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Thermoplastic Station Wire

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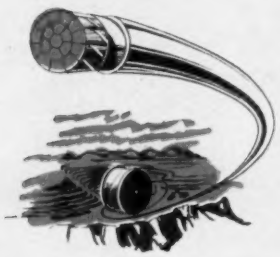

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Report of USITA Accounting Committee

By W. H. TODD, *Chairman*

YOUR ACCOUNTING Committee is again privileged to submit its report for the past fiscal year. This report contains the committee's thoughts on the various subjects as well as their conclusions and recommendations.

The major part of the activities involve proposals on rule making by the Federal Communications Commission and the Internal Revenue Service. The members of the committee represent both the large and the small Independent telephone companies and so an effort is made to express the broad view on all problems presented. It is my belief that the Accounting Committee should give consideration to the effect on all telephone operations in arriving at their conclusions. It should be remembered that actually the accounting function resembles the middle man, by using material originated by one department and produces a product for the use of another departmental activity.

The first item considered was the proposed rule-making adopted by FCC Docket 13396 in the matter of amendment of Parts 31 and 33 of the commission's accounting rules relating to retirement units for aerial cable and aerial wire. Comments were filed on behalf of AT&T, the REA . . . and the USITA Accounting Committee. The Report and Order adopted by the FCC was issued on June 23, 1960 and followed closely the original proposal.

The next item for consideration was the proposed rule-making in FCC Docket 13453 adopted by the commission's rules for Class A and Class B telephone companies to change the requirement for filing journal entries recording plant acquisitions. The adoption of this proposal would result in substituting $100,000 and $50,000 for the amounts of $50,000 and $25,000 for Class A and Class B telephone companies respectively. Your committee recommended the adoption of the proposal. Under date of May 25, 1960 the commission adopted the change as proposed.

The next proposal brought to our attention was proposed rule-making in the matter of amendment of schedules pertaining to wages and hours of employes in Annual Report Forms—(Form M, Class A and B Telephone Companies; Form O, Wire-telegraph and Ocean-cable Carriers; and Form R, Radio-telegraph Carriers) as scheduled under Docket No. 13459. The committee recommended that the various reports provide for the continuance of reporting the number of employes receiving less than the minimum wage under the Fair Labor Standards Act, and for the remaining brackets to be set out in steps of 25 cents each. Giving consideration to the number of wage brackets now included on the various forms, this proposal would necessitate retention of reporting the number of employes receiving less than $1.00 per hour with the top bracket covering employes receiving $4.25 per hour and over. To date we have not had the benefit of further views of the commission.

The committee was advised of the receipt of a letter from Deputy Administrator Foreman of the REA recommending that the USITA consider the desirability of proposing to the FCC certain changes in its accounting rules. The proposal of the REA would eliminate the separate system of accounts for Class C telephone companies and establish only one basic uniform system for all telephone companies subject to FCC jurisdiction. They have set forth the following advantages, which in their opinion, would be gained:

(1) It would put telephone accounting on a consistent basis.
(2) It would simplify accounting system changes occasioned by growth.
(3) It would result in more comparable statistical data.
(4) It would enable uniform guide lines and accounting instructions to be prepared.

The committee reviewed the request and conditions existing due to variation of systems in use between Class A and B and Class C telephone companies and was in agreement with the merit on statistical reports, but felt it could not go on record with a recommendation which was certain to create a hardship on a number of smaller Independent operating companies. It is also a fact that very few Class C companies are subject to FCC jurisdiction and, therefore, they would not be covered by the proposed change.

We have recently received a copy of a Report and First Order adopted by the FCC on July 7, 1960 in connection with proposed rule-making in Docket 13080. This rule-making related to amendment of Part 45, Preservation of Records of Telephone Carriers, and Part 46, Preservation of Records of Wire-Telegraph, Ocean Cable and Radio-telegraph Carriers, of the Commission's Rules and Regulations to reduce the retention periods for payroll, employe service, mortality, and related records, and to combine into one part the present two parts. The committee was in full agreement with the proposal and we are happy to report that in practically all instances the commission adopted the changes in the original notice.

The final proposed rule-making was

in the matter of Amendment of FCC Form L, Annual Report of License in Domestic Public Land Mobile Radio Service as covered by Docket No. 13631. The committee voiced no opposition to the proposal.

The information furnished to date on the Accounting Committee activities has no doubt bored you sufficiently and we will now give you a report on the activities of the various sub-committees of which your chairman is a member.

You will recall that in 1958, the Washington office realized the need and created a sub-committee on mark-sensing. This committee is composed of D. A. Perigo, A. A. Wilson, K. L. Lawson and your chairman from the Accounting Committee. The procedure of mark-sensing toll tickets is relatively new and has actually only been in use a few years. . . .

The first meeting of the sub-committee on mark-sensing was held in Chicago in January 1960, and was attended by all members of the sub-committee and representatives of the AT&T. The purpose of the meeting was to discuss the ramifications of mark-sensing toll tickets, exchange experiences that were found to be helpful, and to explore areas in which uniform procedures would be mutually beneficial between operating companies. Some of the specific items discussed were the following.

(1) Merits of Plan 1 and Plan 2 toll ticket.
(2) Automatic computation of timing.
(3) Accounting costs under mark-sensing compared to previous methods.
(4) Coordination between AT&T, Bell System companies, and Independent companies.

A second meeting was held in New York City in April 1960 and attended by the same group as the Chicago meeting. At this time we were advised by AT&T representatives that the Bell System operating companies planned to standardize on Plan 2 ticket. The proposed ticket format was reviewed, with variations, which could be introduced in a highly concentrated manual area, while still maintaining uniformity with respect to the following areas:

(1) Punching columns 1-29 to 57-80.
(2) Interpreting fields.
(3) Control punches.

The advantages of Plan 2 ticket were discussed from an accounting and commercial point of view and it was pointed out that while, initially, traffic might realize an increase in operator work time, experience has indicated that, over a period of time, increased efficiency could offset this factor. The importance of standardization by all segments of the telephone industry was stressed and the approach that was being taken in the Bell System in order to accomplish this objective was reviewed.

It was realized that there is a definite need for more specific information and a greater understanding by many of the smaller Independents, who are not mechanized, but receive mark-sense tickets for billing. It was agreed that a cooperative program by the Bell System and the larger Independent companies could materially assist in improving the use of mark-sense toll tickets by the smaller operating companies. This data should contain exhibits of the various toll tickets, e.g., collect, third number, and credit card, defining the entries on each ticket and identifying the pertinent information required for manual billing.

It was agreed and understood that the USITA representatives could not commit all the Independent companies to any one type of ticket or procedure, but it was felt that a more complete educational program on mark-sensing of toll tickets would eliminate a number of the present problems. We believe these two meetings have established a beneficial channel of communications between Bell System companies and Independent companies.

The ever changing field of telephony has now introduced a trend to All Number Calling known as ANC. Your association has seen fit to appoint a sub-committee on All Numbering Calling, with A. A. Wilson of the Engineering Committee, as chairman. The Accounting Committee is represented on the new sub-committee by your chairman. A meeting was held in New York City in June of this year with one of the major topics being All Number Calling. AT&T is definitely committed to the ANC program, but they are exerting no pressure on the operating companies as to their introduction of ANC.

Exchanges not yet on 2L-5N basis will become ANC but this affects only 10 per cent of their exchanges as approximately 90 per cent is currently on 2L-5N. In some areas, the operating companies plan to introduce ANC whenever new numbers are assigned, even though the existing lines in the same central office unit are on a 2L-5N basis. The final cut to 2L-5N could be made when the per cent of 7N would warrant the conversion of the balance of the subscriber's numbers.

To the best of our knowledge, no major city contemplates making a flash cut-over from 2L-5N to ANC. This is contrary to newspaper reports that Los Angeles would be the first major city to convert all numbers to 7N. A number of Independents have already set up a plan to go to a 7N as quickly as possible.

It would appear easier to convert smaller exchanges on a flash program. Complete conversion to ANC by the telephone industry must, by necessity, be spread over several years because of the complex problem of resetting directories from one style to another. . . . This (ANC) is a program that is highly beneficial to the accounting department as all punch card installations are more adaptable to handling digits than letters.

Now for a quick look into the future. The past record of the Independent segment of the telephone industry speaks for the progressive and broad view of management to accept new developments and be the leaders in engineering equipment to further more efficient telephone service to a public which expects the best and accepts no substitutes.

We are told that mark-sensing of toll tickets might be only an interim step to the day when all toll calls will be recorded on tape. This will mean faster and more highly developed machines to handle the ever increasing volume of business offered. The further development of data processing equipment which will require less floor space, fewer machine operators and a greater flexibility of expansion at lower unit costs is a positive goal.

Industry today is competitive and, although we are a regulated industry, we must face facts and realize we are a part of a highly competitive business world. We enter the 1960's knowing that the demands for improved telephone service will be greater than any previous period in our history. . . .

May I close this report by stating that the members of the Accounting Committee feel that increased attention must be directed to the accounting problems of our industry. New techniques and changed thinking on the part of regulatory groups present a challenge, a challenge which must be met so that we can evaluate the changes for the management people of the member companies of our Association.

Faith Is Basic

"Faith is the inspiration of nobleness, it is the strength of integrity; it is the life of love and is everlasting growth for it; it is courage of soul, and bridges over for our crossing the gulf between worldliness and heavenly-mindedness; and it is the sense of the unseen, without which we could not feel God nor hope for heaven."—WILLIAM MOUNTFORD.

Mark-Sense Toll—

Problems it has created and solved for accounting

By D. W. SMITH*

(An Accounting Conference Address)

IN DISCUSSING this subject, Mr. Smith divides his comments into five major classifications—(1) Background; (2) Problems created by the plan; (3) Problems solved by the plan; (4) Aids to the problem areas; (5) Summary—*Editor's Note.*

I. Background

A. *Why Toll Mechanization?*

1. The largest single expenditure of clerical time in revenue accounting operations is in the manual billing of toll charge slips. In this area the search for improved techniques and lower costs, common to many large clerical operations, resulted in a mechanized procedure.

2. The first major advance into mechanized toll accounting occurred when automatic toll ticketing was developed for use with dial equipment. The Bell System now has extensive Automatic Message Accounting installations which in many accounting offices produce upwards of 50 per cent of the total toll volume.

3. This extensive volume of messages resulted in mechanized billing procedures with the punched cards produced from the output of the automatic toll ticketing equipment. Properly executed mechanized procedures will reduce clerical operations in the accounting department just as the dial equipment reduces the force burden in the traffic department. This mechanized procedure for automatically recorded messages did create a second toll billing operation, as operator handled messages written on paper tickets continued to be billed manually.

4. Operator handled traffic will always exist, even with refinements to the automatic toll dialing and recording equipment which will permit more messages of various types of traffic to be recorded automatically.

5. It has been recognized that completely mechanized or electronic accounting offices are the only practical way of processing the mass of data involved in the large telephone accounting operations.

B. *Why the Mark-Sense Toll Plan for Operator Handled Traffic?*

1. Here, then, developed the problem of integrating the manual and mechanized billing procedures for toll charges as part of a complete mechanical or electronic accounting office.

2. There have been many attempts to solve this problem with trial installations of key punching toll tickets, tape writing and mark-sense plans.

3. From these trials it developed that the only satisfactory solution to the problem is to capture in mechanized form the details of the call handled by the operator at the switchboard. The mark-sense plan has this advantage. Trial installations are now in progress which permit the operator to add details of the call for person-to-person, collect, and other special instruction type traffic to that information recorded by the automatic equipment. However, even this plan will require the preparation by the operator of certain memorandum tickets.

4. The Bell System, with its heavy volumes of AMA toll billing and its desire to mechanize revenue accounting operations, adopted the mark-sense toll plan as a system recommendation. Several Independent telephone companies had automatic toll ticketing or mark-sense toll installations before the adoption of a plan by the Bell System. However, the adoption of a mark-sense toll plan by the Bell System motivated the industry into a consideration of the plan. Other telephone companies then adopted similar mark-sense toll plans.

C. *What is the Mark-Sense Toll Plan?* Briefly, it follows this general pattern:

1. The traffic operator substitutes a card for the traditional paper toll ticket.

2. A pencil with a high graphite content lead is used to mark in predetermined positions on the card basic details of the call. These details include (a) terminating point information such as the Numbering Plan Area code and central office and line number identification; (b) day, night, or person identification as well as type traffic, and (c) originating information such as central office and line number identification. Longhand notes are also written on the card in either the portion which resembles the traditional toll ticket or on the reverse of the card. Timing entries are also made on the reverse of the card by either a calculagraph stamp or in longhand.

3. The cards are then forwarded to the accounting office where the marks on each card are mechanically converted to punched holes in the same card.

4. The cards are punched with additional identifying data and are then associated with a second group of cards containing rate structure information. The combined group of cards are processed through a machine which calculates the charges for each message and punches this and other data into the original card. This rating operation is similar for automatic recorded and mark-sense recorded messages, and the two groups of toll messages may be combined at this time.

5. Statistical reports and separations by type traffic are accomplished by a series of machine operations.

6. Information punched in each Sent-Collect message card billed by a distant accounting office is interpreted and dispersed to those offices.

7. Regular messages and Received-Collect messages, which must be converted to punched card form, are filed until billing. At billing the cards are mechanically arranged in line number order and are printed on the toll statement.

D. *Economics of the Mark-Sense Plan.*

1. This plan can be very costly or can have very definite economic advantage. The Bell System has stated economic savings as a result of the

*Mr. Smith is with General Telephone & Electronics Service Corp. of New York City.

plan. The General System companies have found both estimated savings and loss under a complete mark-sense plan. Generally, a situation where there is a high volume of operator handled business and automatic ticketing equipment with concentrated areas of originating business lends itself to the mark-sense plan. In the General System we have also employed parts of the plan which are easily assimilated into our operations and afford some economic savings.

2. Many factors influence the cost or savings under a mark-sense plan. In any cost consideration of the plan, the following items should be reviewed:

(a) Consider the cost of the present job of toll billing under manual methods, particularly in those cases where the timing and rating of toll tickets is accomplished by the night operators during non-busy hours. Under the mark-sense plan, rating is accomplished by the accounting department at a centralized location with measurable cost, not as a "fill-in" job at decentralized locations.

(b) Consider the volume of toll messages as this volume determines machine requirements and the utilization of equipment which might have high unit rental. Other punched card procedures within the department might afford surplus machine time that could be utilized by a mark-sense plan.

(c) Consider the geographic dispersion of the originating toll and the related pattern of terminating business. Widely dispersed or closely grouped community of interest toll patterns have a direct influence on the extent and maintenance of rating material.

(d) Consider the extent of automatic toll ticketing equipment planned in your own company and the plans of your Connecting Company for mark-sense or automatic toll ticketing conversions.

(e) Consider the economic advantage of adopting a portion of the mark-sense plan.

(f) Consider the cost of planning, training, control, and installation of a mark-sense plan. This is as acute in mark-sense planning as in any punched card conversion.

3. As an example of the above considerations, some experience of the General System's cost estimates might be of interest:

(a) One of the General System companies that has a comparatively large automatic toll ticketed volume (approximately 350,000 monthly) prepared a mark-sense cost study. Planned toll recentering, Extended Area Service, SATT conversions, with equipment requirements and relatively small real traffic savings as a result of the centralized mechanical rating in accounting, deferred the adoption of mark-sense procedures for 1½ to 2 years, when a new study will be made.

(b) Another General Telephone company with a monthly toll volume of approximately 1,800,000 messages originated entirely by operators and no SATT conversion plans until 1961, adopted the mark-sense plan immediately. This was because of the concentrated area originating the toll and the comparatively high cost of manual toll rating in the accounting department.

(c) In a third General Telephone company, cost studies showed a complete company mark-sense plan would not have economic advantage. However, following the conversion of one toll center to SATT equipment, the mark-sense plan was adopted for the balance of the operator handled traffic from that toll center.

(d) A fourth General Telephone company has approximately 70 per cent of its toll ticketed by its connecting Bell company. The Bell company developed plans for a mark-sense toll plan which included those offices ticketing General business. Arrangements were made to receive the full-size rated mark-sense card from the Bell company and mechanically sort to telephone number order and print the toll statement at the General Telephone company's office.

Left to right: Mrs. Paul R. Parsons of Rhinelander, Wis.; Mr. Parsons, and Mrs. Alice Parsons of Riverside, Ill.

II. Problems Created by the Mark-Sense Toll Plan

A. *Industry Problems.*

1. During the early stages of the plan a lack of knowledge and understanding of the plan and the basic toll card caused confusion in accounting offices attempting to bill received collect cut mark-sense cards.

2. This confusion resulted in negative attitudes, and developed a reluctance to change in this historic portion of telephone work.

3. The variation from the recommended industry standard toll card by certain participating companies in the interpreting and punching positions, as well as card format and cutting size, caused confusion when these non-standard cards were interchanged for billing.

4. In addition, machine and clerical errors inherent in all large operations created many billing errors. These errors, while percentagewise small, were large in number because of the large total volume involved.

B. *Company Problems.*

1. A reasonable number of problems are expected in any mechanized conversion program. However, this number was exceeded in most mark-sense conversions. One reason for this is that the mark-sense card is hard to read even to an experienced person. The mark-sense card format has no bearing to the punch positions.

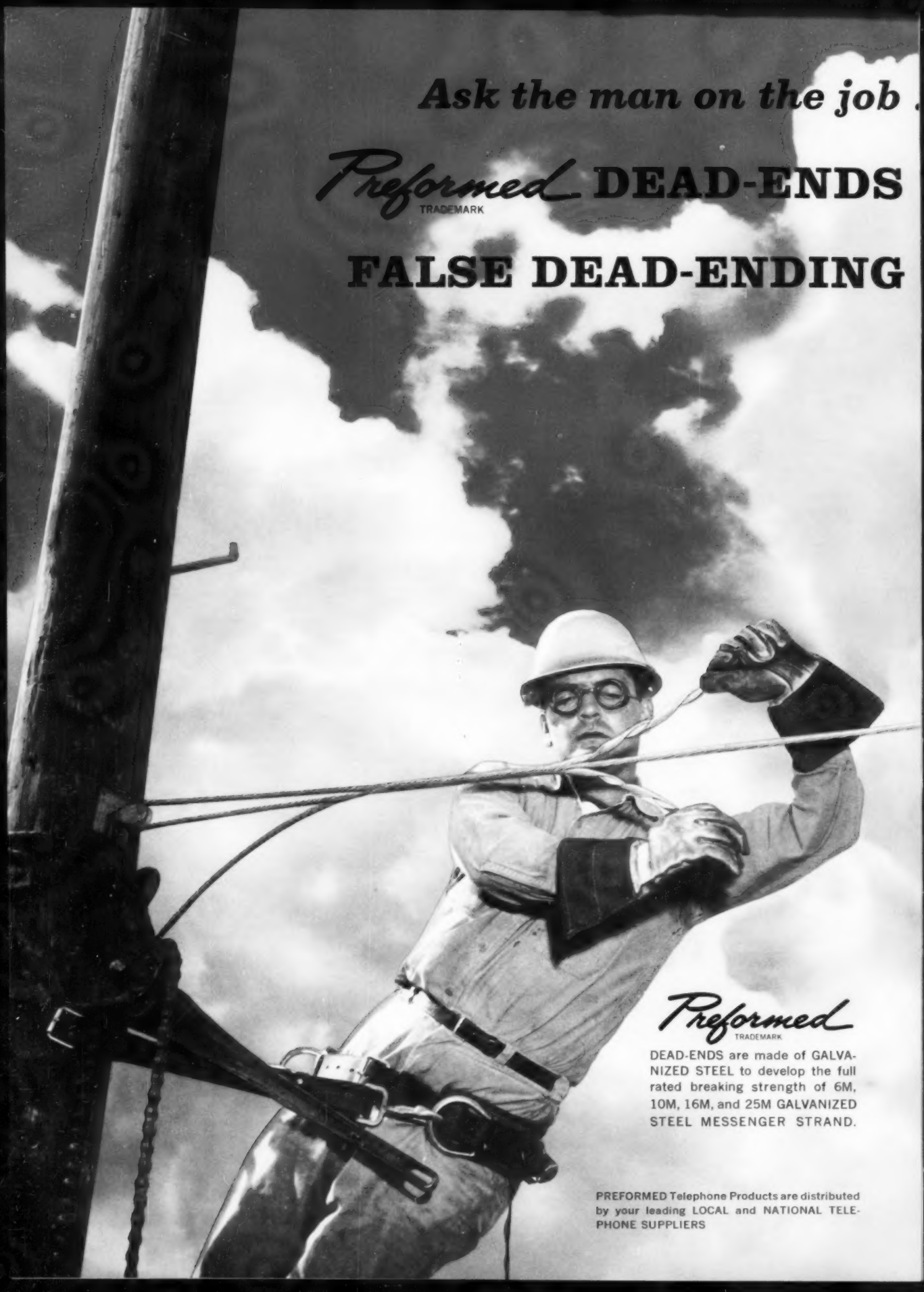
2. The mark-sense punch operation is not the best type of operation for originating punched data. Even with close supervision, the quality of marking and technical errors cause many cards to reject from the initial processing. This volume of rejects requires manual review and insertion into the flow of work when corrected. As an example: One of our companies converted its pilot office in May of this year. Initially, rejects occurring in the process of punching from the pencilled mark-sensing ranged to 50 per cent of the total volume. This was reduced to 1 per cent in several weeks by a concentrated operator effort.

3. The mechanical rating has proved a problem area. The volume of master cards and complexity of machine programs open the door to punching errors. The establishment and maintenance of the master rate decks requires extensive manual effort. The size of the master rate card deck can be very large if you consider the number of central offices available to any other central office.

4. While in volume, mechanical rating assumes the burden of the rating work, manual rating is a necessity. In fact, the most difficult type of rating remains to be done manually. This includes such rating as ship-to-shore, Canadian, messenger service, and calls to points not numerically coded.

5. When the rating operation is not functioning smoothly, statistical

(Continued on page 136)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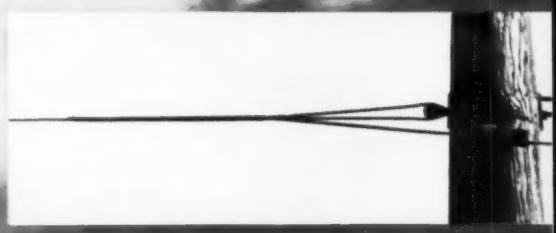

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Responsibility Accounting

By JAMES R. DEPAUW*

(An Accounting Conference Address)

MY TOPIC today is responsibility accounting. Responsibility accounting has been used effectively in a number of public utility, transportation and industrial enterprises as a tool to control costs and to provide meaningful information to assist those people concerned with operating problems at the lower administrative levels as well as at the top management levels.

Considerable interest has been displayed by the operating people at all levels, who are running the day-to-day operations of the company, once they understand what this modern but simple concept of financial reporting will do for them. The most significant contribution which any accounting system can make to a company's success is the preparation of reports which are useful tools for managerial cost control. Reports are no substitute for supervision, but we accountants can provide valuable tools for management's use in exercising control over costs and operations.

Responsibility accounting is an accounting system designed to control expenditures by directly relating expenditures to the individuals in the company organization who are responsible for their control. This system results in the preparation of accounting statements for all levels of management, designed primarily so that they can be effectively used by the operating people as a tool in controlling their operations and their costs.

It is a system which emphasizes information that is useful to the operating management and de-emphasizes the accounting and bookkeeping aspects that clutter so many of our accounting and financial statements today. Since this system is premised on the idea that, to control costs, the accounting information should show who is responsible for incurring the costs, it is appropriately called responsibility accounting.

Control of operating expenses can be achieved only by relating performance to responsibility. A system of responsibility accounting recognizes this. In any system of responsibility reporting there are three elements of prime importance. One is the plan of operations, which is normally referred to as the budget; the second is the report which flows from the basic system; and the third is the explanation of data contained in the report. Another element of considerable importance, although not an absolute requirement, is accounting mechanization. This element is particularly important where it is necessary to also prepare commission reports under a prescribed system of accounts because mechanization facilitates "reshuffling" of the source data to produce these additional reports.

I would like to discuss each of these elements briefly. . . . The first is the plan or budget. Budgets, to be most effective, should be based on the underlying idea or philosophy that they are prepared by and attributable to the individuals who are responsible for incurring the costs and who are in a position to exercise control over those costs. Each responsible supervisor in an organization should feel that the budget is his budget and not something forced upon him by his superiors which he might feel is unrealistic and unattainable. Since effective cost control can be attained only at the operating level, it is essential that the persons responsible for the operations at that level participate in the preparation of the budget.

As mentioned earlier, in a responsibility accounting system expenditures are segregated and reported to the individuals responsible for their control. What is more logical than to prepare the budget in the same manner and segregate budgeted costs by the individual responsible for their control! And certainly the responsible supervisor is in the best position to submit a budget for his future operations, within the over-all objectives of the company. This proposed budget naturally would be subject to review at each administrative level as considered necessary and combined into the proposed company-wide budget for review and approval or revision by top management in view of the over-all company objectives.

Sound judgment in planning and evaluating future operations at each level of responsibility is probably the most important single requirement for the preparation of a sound budget. The budget should have direction with definite objectives in mind. A recent speaker at a similar accounting conference made the point that intensive planning should be our objective in budgeting; the establishment of attainable goals is far superior to submission to trends. It is obvious that submission to trends is more in the nature of projecting our fate than planning our future. A budget program, with definite objectives, offers the greatest incentive to management when each level of management has a part in establishing those objectives and has at hand the tools of accomplishment.

Normally, company budgets will consist of two parts (1) the operating budget and (2) the construction budget. Both should be budgeted by and re-

*Mr. DePauw is with Arthur Andersen & Co., Chicago, Ill.

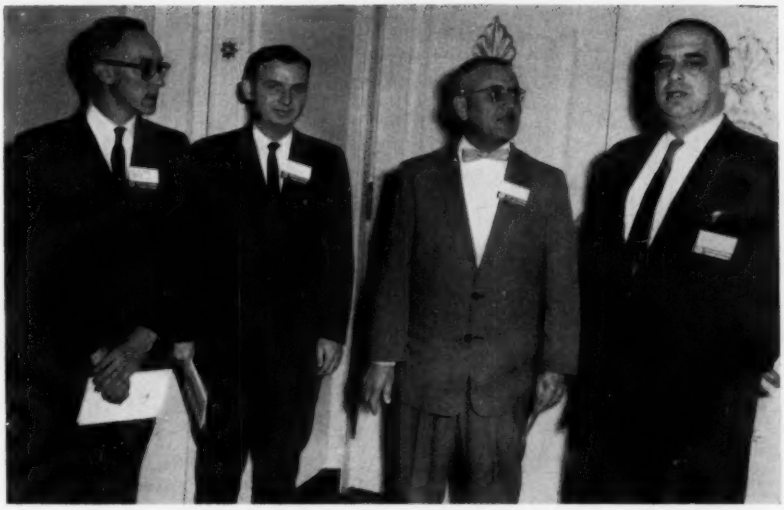
ported to those individuals responsible for incurring and controlling these costs. Under responsibility accounting, the operating budget should be built up from the budgeted costs for each work operation within each responsibility area and, likewise, the construction budget should be an accumulation of specific projects or subprojects within each responsibility area. Those projects for construction work to be done by outside contractors should be budgeted by the supervisor who is responsible for controlling the contract costs.

Physical performance of the work budgeted is an inseparable part of an ideal budget plan. That is, it is extremely desirable to budget not only the estimated dollar expenditures, but also the expected work production to be derived from those expenditures. This area is of prime importance because budget performance cannot be fully evaluated without consideration of how much actual work was accomplished.

For example, assume a budget authorization for $5,000 to complete 20 miles of repair work to pole lines. If the responsible supervisor has expended the $5,000 but only completed 15 miles of work, he may not perform the repair work for the five remaining miles and show no budget variance. This is one of the problems of management control which we will be hearing much more about in the future.

Without digressing further, since work measurement is a complete topic in itself, let me just say that there are several significant problems in setting up a system to evaluate physical performance, such as the development of practical work units, fair performance standards and accurate reporting of work performed.

One thing is certain, when adequate performance standards are established they will be most effectively used only if they are put in phase with the responsibility reporting of budgeted costs, expenditures and variances from the budget as contemplated in responsibility accounting.



Left to right: William J. Moore and Hugh A. Carr, both of New York City; Col. K. Buchak and D. L. Solomon, both of Washington, D. C.

The second element of a responsibility accounting system is the report which flows from the basic system. It is imperative that this report be designed so that it can be fully understood by the reader. This is basic for any management report. By this I mean the report must be designed with the operating man in mind and, therefore, should be divorced from accounting and bookkeeping conventions which are understood, for the most part, only by accountants.

For instance, what operating man really understands payroll accruals, vacation accruals, clearing accounts, retroactive pay adjustments, administrative expenses capitalized, allocations of overheads, unvouchered invoices, loadings for unproductive time, interest during construction and other accounting complexities.

Perhaps the most important step toward designing a report of this nature is to perform a comprehensive review to obtain an answer to the question—What does each responsible supervisor need to know and how can this be most clearly presented? Each responsible supervisor is concerned with accomplishing the work under his jurisdiction. This work can be divided into work operations which may or may not correspond to the prescribed commission accounts. The budgeted costs, expenditures and budget variances should be reported by these work operations and should include only those costs for which he is responsible and over which he can exercise control.

The third element of a responsibility accounting system is the explanation of data contained in the report to the operating man; that is, what is included in these reported figures. Budgeted costs and expenditures, as you know, are made up of labor, material and other costs and it is this breakdown of costs that should also be reported to the responsible supervisor to assist him in analyzing budget variances which will provide him with a basis for determining corrective action.

Here again, this information should be reported in a manner which will be clearly understood by the supervisor. One of the more effective ways to present this information is to show the component parts such as labor, material and other costs for each work operation.

In addition to these three elements, there is the important factor of accounting mechanization. I realize that not everyone here today represents a large company with complete accounting mechanization. The absence of machine accounting does not preclude the use of responsibility accounting. However, a mechanized accounting system

Left to right: J. K. Baird of Gallup, N. M.; L. J. Sevestre of New York City, and Vivian Ryden, TELEPHONY's circulation manager.

provides a greater degree of flexibility in the preparation of other types of accounting reports such as reports to regulatory bodies and financial reports to stockholders, which are prepared on a different basis than the responsibility reports.

Some of the questions which many of you most likely have foremost in your minds at this point are—What about the accounting department problems in producing reports of this nature in addition to the conventional financial statements? And—doesn't this increase the record keeping costs? I can tell you from experience that many companies are effectively using this modern approach to management reporting with certainly no more accounting problems than they experienced under other methods.

As a matter of fact, generally there will be fewer problems because operating people at all levels of responsibility as well as top management will be better supplied with management information, thus reducing the requests for special reports, analyses and summaries. And supplying this information, I'm sure all of you accounting people will agree, is your basic and most important function as a service department of the company. In substance, what I am saying is that under a properly designed and installed system of responsibility accounting, it is relatively easy to reshuffle the source data into the necessary groupings for commission, stockholder and other types of reports.

As far as cost is concerned, the cost of operating a responsibility accounting system varies from company to company, depending on the respective requirements, and as to whether or not there will be increased costs depends first of all on what is expended under the present system. If there are increased record-keeping costs, and it should not be presumed that this is inevitable, I believe that the replacement of confusing and inadequate reports with meaningful and useful management information will produce benefits that offset any such increment.

Left to right: A. Broadley and K. Yates, both of Winnipeg, Manitoba, Canada, and D. J. Green of London, England.

There are two cardinal rules or principles, if you will, which dictate to a large extent the success or failure of any responsibility accounting installation. First, there must be a clear-cut and definite organizational structure. That is, the lines of responsibility must be clearly defined, understood by all concerned, and workable in carrying out the operations of the company. Second, the system must be tailored to this well-defined organizational structure. The appropriate costs must be reported to the appropriate individual and this means reporting only those costs to that individual who is responsible for them and their control.

(At this point Mr. DePauw presented slides illustrating a responsibility accounting system for a hypothetical telephone company.)

As you can see from the illustration, this modern approach to management reporting, in effect, personalizes the accounting statements by saying, "Joe, this is what you originally budgeted and this is how you performed for the period with actual operations as compared against your budget."

In summary, let me leave you with these two thoughts.

Responsibility accounting is a concept of management through the use of accounting information prepared specifically for that purpose rather than in conventional financial statement form.

This concept can be, and has been, effectively applied to most all types and sizes of companies.

Left to right: W. F. Corman of Atmore, Ala.; Norman A. Howerton and R. D. Shoemaker, both of Ilwaco, Wash.; Charles Meacham of Centerville, Ia., and J. C. Gabbard of London, Ky.

State the Servant

"Apart from the threat of military attack, which is a question in itself, the only thing we need fear from the Soviet economic pattern is that we should imitate or adopt it, even in part. Only if and as we maintain in our own lives the historic American principles of individualist opportunity in economics and other fields, shall we worthily fill our historic destiny as champions of the principle that the state should be the servant of its citizens, not the master of its subjects." — WILLIAM HENRY CHAMBERLIN, *Author.*

Recent and Possible Future Changes in Accounting

By DONALD F. MacEACHERN*

(An Accounting Conference Address)

A LOT OF PEOPLE have talked and written about the almost incomprehensible changes that have occurred during the lifetimes of most of us. Some of the most dramatic of these changes have occurred in our business within our own memories: Telephone conversations across the continent beginning in 1915, across the Atlantic beginning in 1927, and now conversations bounced off satellites and even the moon; also, the advent of microwave radio relay, deep sea voice circuit cables, station and switching developments.

While all this has been going on there have been relatively few changes in the Uniform System of Accounts, partly because the system was broadly designed in the first place, and partly because all concerned have made the system fit new developments wherever possible, even if that sometimes required a little squeezing, such as classifying large microwave towers as buildings.

Of course, when really necessary, the system has been amended. That was the case in 1957 when the new station accounting was promulgated. Several years prior to that, the NARUC (National Association of Railroad and Utility Commissioners) had asked the telephone industry its views on "meter" accounting for telephone sets and depreciation accounting for station installations and drop and block wires.

Industry Presents Views

At first it seemed that the disadvantages outweighed the advantages, but there was a tremendous potential in eliminating clerical work, particularly on the part of the craftsmen. Accordingly, a special task force was established at AT&T headquarters, composed of accountants, engineers and plant administrators. This force and your (USITA) accounting and engineering committees jointly developed the basic concepts of the revised station accounting. Thus it was possible to present to the FCC a mutually satisfactory industry proposal, which was subsequently prescribed to become effective optionally on Jan. 1, 1957 or Jan. 1, 1958.

As a result of these revised rules we have been able to make considerable savings in clerical work and, in addition, we believe that we are getting a much better accounting answer. Presumably the new accounting has been pretty well shaken down in your companies by now, so we need not dwell on this.

Studies General Reform

The task force established for station accounting was succeeded for a time by another task force which studied general reform of our accounting processes. Some of the survivors of those forces now constitute a group in my organization. Its members, along with our engineering and other people, have been looking into other areas of accounting, reporting, or recording practices where substantial clerical savings and further simplification may be achieved. Certain of their recommendations require changes in the accounting rules, particularly for the Class A and B companies. Their over-all objective is to simplify the record-keeping job and to reduce paper work without disturbing the over-all integrity of the accounts.

Your cooperation and assistance have already advanced the industry's progress in this continuing battle against paper work. We deeply appreciate your help in this field and look forward to a continuation of working together in presenting an industry-wide approach to our accounting problems. In this way recommendations can be made for changes that are mutually acceptable to all companies in the industry, regardless of their size.

Changes Listed

Some of the recently effective changes based on the recommendations of the task force and others are:

(1) *Elimination of Account 207 Right-of-Way.* This account has always been a nuisance and was difficult to administer.

You will recall that under the accounting previously in effect, the cost of permits to locate poles, cable, wire and conduit was included in Account 207 when the expected period of occupancy under such permits exceeded the estimated life of the initial plant. However, the cost of the permits was included in the account appropriate for the cost of the property constructed when the expected period of occupancy did not exceed the estimated life of the initial plant, and when the permits were for placing cable and wire on buildings and fences, regardless of the expected period of occupancy.

Cost of Physical Plant

Rights in land used for buildings, similar to those classifiable as right-of-way if acquired for outside plant, were classifiable as land.

Thus, under the previous accounting, costs of a right-of-way nature might be includable in Account 207, Account 211 Land, or the account appropriate for the property constructed, depending on the circumstances.

The previous accounting was based on the theory that most rights-of-way

*Mr. MacEachern is Chief Accountant of American Telephone & Telegraph Co.

have lives of their own which exceed the lives of the physical units placed on those rights-of-way, but in practice the actually experienced life tends to be shorter than the prospective life because additional right-of-way costs are frequently incurred when replacing plant is constructed, regardless of strict legal requirements.

The new accounting treats the costs of right-of-way, other than land in fee, as a part of the cost of the physical plant, just as the initial survey and engineering cost and the cost of the initial holes for the poles are treated. This is consistent with the view that each generation of physical items within a given plant class should bear the actual costs incurred for such generation of items.

The elimination of Account 207 for Class A and B companies was made effective Jan. 1, 1960 in our companies and has made the accounting and reporting work simpler and less costly. It has obviated having to decide for classification purposes whether the period of occupancy under permits obtained for locating outside plant is expected to exceed the life of the initial physical plant. All of the record-keeping and accounting work involved in keeping a separate account for right-of-way, such as maintaining continuing property records, developing and maintaining retirement unit costs, and making retirement entries has been eliminated.

Account 602.9 Eliminated

(2) *Elimination of Account 602.9 General Supervision, Engineering and Tool Expenses.* Under the previous accounting prescribed for Class A companies, the costs of general supervision, engineering and tool expense were included in all maintenance expense accounts except in the case of those accounts that relate to the maintenance of outside plant. It seemed desirable for administrative purposes and also advantageous in the accounting processes to include the cost of general plant supervision, engineering and tool expense in the accounts for the related maintenance work performed.

With the elimination of Account 602.9, the cost of maintenance work is now expressed on a basis more consistent with that used for calculating the cost of construction and removal work. This treatment of general plant supervision, engineering and tool expense is also consistent with the treatment of other allocated and indirect costs such as local plant administration, motor vehicle expense, supply expense, and miscellaneous expenses of Plant forces.

Engineers' Work Increased

However, the elimination of Account 602.9 by itself would have increased the amount of detailed reporting required of engineers under our practices. The requirements for detailed reporting were based on our interpretation of the texts of Account 705 Engineering Expense and Account 706 Plant Supervision Expense in the Uniform System of Accounts.

In order to clear the expense on the basis of "the time devoted to particular jobs," it would have been necessary for the engineers to divide the small amount of time spent on minor, routine jobs among the various accounts. In the case of routine outside plant jobs, it would have been necessary for the engineer to subdivide the time which had previously been classified to Account 602.9 among a number of different maintenance accounts.

However, the burden of this subdivision only pointed up the difficulties of direct assignment of minor amounts of engineering time to individual account codes. The field craftsman classifies his time on the basis of the physical operations performed, but the engineer must translate his time into terms of future activities.

Many Considerations Involved

Engineering considerations of an over-all nature, supervisory and travel time, the presentation and rejection of alternative plans, the timing and processing of the order and similar broad general engineering effort must be broken down into the many account codes without having a precise means for doing so. We believe that there is no absolute association of the engineering effort with each of the primary accounts or sub-accounts involved in many jobs. The engineers, accordingly, would have had to decide whether to divide their time on a particular routine job on the basis of a broad estimate of the total cost by accounts, on the basis of the amount of the estimated productive labor by accounts, or they would have had to attempt to time and subdivide their mental effort by accounts. None of these methods for reporting engineering time is practical for routine jobs.

It did not seem appropriate for the System of Accounts to prescribe a specific clearance basis since companies differ not only in size and make-up of engineering forces, but are constantly working to develop procedures for work simplification and to produce results that will be more useful from an administrative and regulatory point of view. Therefore, the proposal was made and accepted that the texts of Account 705 Engineering Expense and Account 706 Plant Supervision Expense be modified to permit other equitable bases of clearance where direct apportionment is impracticable.

Report in Three Categories

Pursuant to FCC rule-making in March 1959, which we made effective retroactively to the first of that year, the plant field engineers are now required to report their time for minor or routine jobs to only three categories: construction, removals, and maintenance. Clearances are made from those categories on the basis of time reporting of the related labor forces for a representative period. Although the savings are not substantial, the field engineers have less paper work and we obtain a more consistent distribution of their costs.

(3) *Increase in the Minimum Number of Spans of Cable and Wire Constituting a Retirement Unit.* One way to simplify the record-keeping process is to increase the size of retirement units. A step has been taken in this direction with respect to cable and wire. Pursuant to rule-making, as you know, the FCC, in June, 1960, increased the minimum lengths of aerial cable and aerial wire defined as retirement units from one span to two spans for the cable and from two spans to five spans for the wire. The change applies to Class A, B, and C companies and we intend to make it effective next year.

Replacement Jobs Affected

The increase in the size of the units was advocated so that many small replacement jobs, which are really a part of current plant upkeep, but which are now accounted for as construction and removals, could be accounted for as maintenance, with the resulting considerable savings in accounting and other clerical effort.

In the restoration of service after a few feet of cable in a span have been damaged, it is frequently more practical to replace the whole span than to undertake mid-span repairs. When replacing aerial wire because of a break in a span of such wire, it is frequently necessary to replace more than two spans because of damage to the wire at the tie wires in the adjoining spans. We estimated that there are annually somewhere around 15,000 jobs like these in our companies which will move into the maintenance category.

Savings under the new rules are caused partly by the fact that recording and accounting for this work as maintenance will be considerably simpler and less extensive than recording and accounting for it as construction

and removals. This is because work accounted for as maintenance does not give rise to retirement entries or to entries on continuing property records, location records and mortality records. Savings also result from the fact that authorizations and field instructions for maintenance work do not need to be as detailed as for work involving construction and removals accounting.

In the process of the related rule-making, REA stated that from their point of view the units might be too large and, accordingly, FCC instituted a general rule to provide that retirement units may be subdivided where desirable.

Changes Under Study

Changes which have been proposed and are under study by the FCC are:

(1) *Elimination of Crossarms as Retirement Units.* We have requested rule-making by FCC to eliminate crossarms as retirement units and have had some correspondence with the commission on this matter. If the cost of crossarms were included in the cost of poles, substantial savings in both accounting and engineering forces could be achieved. Since crossarms are a dying class of plant, our present meticulous record-keeping hardly seems justifiable when their retirement can be accomplished with reasonable accuracy through other means. Power companies have treated crossarms as minor items for some time.

(2) *Elimination of Cable Terminals as Retirement Units.* We have also petitioned FCC for rule-making to eliminate terminals as retirement units. The introduction of relatively low-cost ready access terminals will increasingly tend to reduce the proportion of investment in cable plant represented by cable terminals and at the same time has complicated the classification of terminals by size. Elimination of cable terminals as retirement units would permit substantial savings in record-keeping.

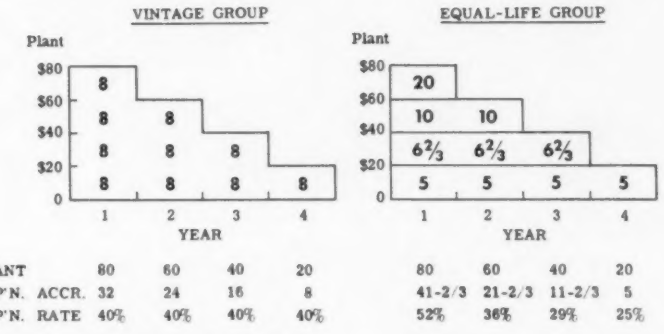
C.O. Continuing Property Records

Among other problems currently being studied by the task force is the problem of setting up in the accounting department detailed continuing property records for central office equipment. This study has not reached the stage where conclusions may be made as to the economic feasibility of the idea.

Over the years we have been making refinements in our depreciation accounting in cooperation with our depreciation engineers. We are currently studying a refinement that is called Equal Life Group depreciation or ELG.

STRAIGHT LINE GROUP PLAN DEPRECIATION

80 UNITS COSTING $1 EACH. INSTALLED AT BEGINNING OF CALENDAR YEAR 1 WITH TWENTY UNITS RETIRED AT END OF EACH SUCCESSIVE YEAR



PLANT	80	60	40	20		80	60	40	20
DEP'N. ACCR.	32	24	16	8		41-2/3	21-2/3	11-2/3	5
DEP'N. RATE	40%	40%	40%	40%		52%	36%	29%	25%

- DEPRECIATION ACCRUED ON BASIS OF AVERAGE RATE: ORIGINAL COST / DOLLAR YEARS = 80/200 = 40%
- ONLY $8 ACCRUED DURING LIFE OF THE TWENTY UNITS RETIRED AT END OF FIRST YEAR.
- UNDER-ACCRUALS OF $12 ON 1ST TWENTY UNITS AND $4 ON 2ND TWENTY UNITS OFFSET BY OVER-ACCRUALS OF $4 AND $12 ON 3RD TWENTY AND 4TH TWENTY
- DEPRECIATION RATE IS CONSTANT.

- DEPRECIATION ACCRUED SO AS TO RECOVER ORIGINAL COST OF EACH GROUP OF TWENTY UNITS DURING ITS LIFE.
- ENTIRE $20 COST OF GROUP RETIRED AT END OF FIRST YEAR IS ACCRUED DURING ITS LIFE.
- ENTIRE $20 COST OF EACH GROUP IS ACCRUED DURING ITS LIFE.
- DEPRECIATION RATE DECLINES.

Table 1

This plan has been given considerable study in the Bell System as far back as 1933 and has been written about by various authors, including economists and regulatory people.

Before describing ELG, it might be helpful to consider the objective of depreciation. As described in the Uniform System of Accounts this objective is to distribute the loss in service value of the property, that is, the original cost, less salvage and plus cost of removal, over the service life of the property under the straight line method. We believe we have met this objective very well by using the Vintage Group method or VG. However, we think we can do better.

Under the VG method, studies are made of the expected service life of each class of depreciable plant placed in a year (hence the term Vintage Group). From these studies an average depreciation rate is determined for each composite class of depreciable plant. If our estimates of service lives, salvage and cost of removal are accurate, the application of that depreciation rate to our investment in that class of plant will spread its cost over its service life.

Study Shows Differences

However, closer study of VG brings out some interesting aspects. Basically it is concerned with the average life of plant placed in a given year. In its application, the cost of any plant which is retired before reaching the average age will not be spread over the life of that plant, but a part of such cost must be spread over the life of the plant that survives beyond the average age. A simple way of saying this is that under ordinary straight line depreciation the longer-lived plant carries a burden for the shorter-lived plant. This condition can readily be seen from the left column of *Table 1*.

In contrast to VG, under the Equal Life Group plan the cost of shorter-lived units is charged to expense while they are in service, leaving the longer lived units to bear only their own burden. This can be accomplished by subdividing each vintage group into smaller groups, each of which is limited to quantities which are expected to have the *same* life. This distribution is accomplished by the use of statistical methods and makes use of the recorded experience with respect to the life and

death behavior of telephone plant. This means that, aside from salvage and cost of removal, the depreciation rate for a particular vintage, when it is new, would be the composite of 100 per cent for the statistical group with one-year life, 50 per cent for the two-year group, 33⅓ per cent for the three-year group, 2.5 per cent for a 40-year group, etc. A vintage which is a year old would no longer contain any one-year plant, and since the 100 per cent rate group is gone, the highest component rate would be 50 per cent. A vintage which is 10 years old would have 10 per cent as its highest component rate, and a vintage 40 years old would have 2.5 per cent as the highest. Thus, the composite depreciation rate for a vintage starts out at some maximum level and declines each year. The ELG principle is illustrated in the right column of *Table 1*.

One Rate Used Under ELG

In practice, the Equal Life Group rates are composited into one rate for all the vintages and categories in a sub-account, so that, on the books, only one rate is used. In theory, the rates should be determined every year, but that is not necessary because plant is constantly being added and retired, with the result that the rate for any account changes very slowly.

In order for this technique to be feasible, a company needs many years of good mortality data on other bases for judging the life characteristics of its plant, that is, how the retirements of various kinds of plant tend to be distributed by age. Since this kind of information has now become available to the Bell System from engineering and statistical data, accumulated over many years, the plan could be made effective at any time.

The ELG refinement in depreciation study technique is not entirely new but compares with other refinements in technique such as the vintage approach, which have been introduced over the years. It is different in that it defines the "group" as being made up of those units which are estimated to have the same life, rather than those units of plant which have been placed in a calendar year.

Falls Within System

We believe that ELG falls within the framework of the present wording of the System of Accounts and comes closer than the Vintage Group plan in meeting the definition of the straight-line method of depreciation accounting prescribed by the FCC, which requires that the service value of property be charged to operating expenses and to clearing accounts through equal annual

STRAIGHT LINE GROUP PLAN DEPRECIATION

Initial Building Costing $100 with 50 Year Life. Addition of $50 at 25th Year

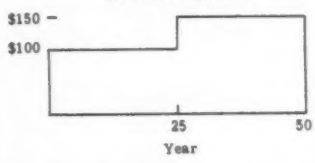
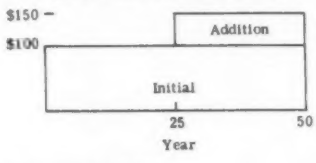
OVERALL GROUP	LIFE-SPAN (VINTAGE) GROUP
	
● Dollar yrs. for initial = 100 x 50 = 5000 Dollar yrs. for addition = 50 x 25 = 1250 Total dollar years = 6250 Original Cost = 150 Average Depreciation Rate 2.4%	● Depr. Rate for Initial 2% Depr. Rate for Addition 4% Average Rate 1st 25 years 2% Average Rate 2nd 25 years 2.7% * * $\frac{(2\% \times 100) + (4\% \times 50)}{150} = 2.7\%$
● Accrs. 1st 25 yrs. = 100 x 2.4% x 25 = 60 Accrs. 2nd 25 yrs. = 150 x 2.4% x 25 = 90 Total Accruals 150	● Accruals 1st 25 yrs. = 100 x 2% x 25 = 50 Accruals 2nd 25 yrs. = 150 x 2.7% x 25 = 100 Total Accruals 150
● Depreciation accrued on basis of average depreciation rate.	● Depreciation accrued so as to recover original cost of each part of structure during its life.
● Over-accrual of $10 during first 25 years offset by under-accrual of $10 during last 25 years.	● Entire cost of each part of structure is accrued during the life of the part.
● Depreciation rate is constant.	● Depreciation rate increases.

Table 2

charges as nearly as may be during its service life.

A close review of the present straight-line depreciation methods discloses that the underlying principles of ELG are already expressed in the Uniform System of Accounts with respect to buildings and central office equipment. Section 31.02-80 states that the percentage rates shall not include any allowance for loss in service value of property expected to be installed in the future.

Prior to 1934, the time when this provision was promulgated, the Bell System worked up estimated service lives for individual buildings and central offices, and, in effect, developed a component depreciation rate for each building and for each central office. The service life of such a structure was itself an average. Since additions are made from time to time during the life span of such structures (some of them very large additions), and since piecemeal retirements frequently occur, the lives of the various elements of a building, for example, will vary widely, and some of them will be much shorter than the building's life span. The shortest lives will naturally be realized by the additions made shortly before the building's retirement, since the retirement of a building, of course, results in the retirement of all the elements then incorporated in it. This meant that the use of an average or constant, depreciation rate for a building or central office throughout its life required that part of the ultimate retirement losses of short-lived additions made late in life had to be made up in over-accruals for depreciation on the long-lived items before the placing of the short-lived ones.

The prohibition against inclusion of any allowance for the loss in service value of property expected to be installed in the future did not affect depreciation of the mass property accounts, but it did mean that the use of an average rate for buildings and central offices had to be given up. With this change, the rate for each structure increases throughout its life as additions are made. This explains, for example, why the depreciation rates for manual central office equipment in the Bell System rose from an average of 5.7 per cent in 1944 to 8.9 per cent in 1949. *Table 2* illustrates this situation.

This change in technique for buildings and central office equipment was a large step in the direction of confining the accrual of depreciation to the time when particular units of property are in service. However, it did not do anything about preventing accruals for loss in service value of short-lived items being made after such items have been retired from service. It is this additional step which would be accomplished by the introduction of ELG.

In our opinion, ELG should be an optional refinement in technique under the present System of Accounts and be equally acceptable with present methods. Hence, any company which may not have as complete mortality data as

(Continued on page 139)

Report of USITA Commercial Committee

By K. L. LAWSON, *Chairman*

COMMERCIAL phases of Direct Distance Dialing (DDD) are in the forefront of problems facing commercial men and women across the country, and your Commercial Committee has devoted attention to the many facets involved in accomplishing this major change in the art of telephony. These problems must be dealt with effectively if the necessary and desirable goal of maximum acceptance and usage is to be attained. People have a natural reluctance to adopt new ideas and ways of doing things, especially when the old way has been efficient and satisfactory.

The commercial job then in setting up Direct Distance Dialing is one of salesmanship and education. People must be sold on the idea that Direct Distance Dialing is modern, desirable, pleasant and easy to use and they must be given instructions for its use that are simple, concise and understandable.

A comprehensive program of advertising and publicity is essential to a proper build-up to the conversion and then should be continued for promotional purposes after the service is in use. Most companies publish booklets of instruction and some follow up their distribution with personal or telephone interviews. Booklets usually contain partial lists of dialable points and pages for listing frequently called numbers. Telephone directories should contain comprehensive instructions and a list of representative dialable points. The addition of major points to the calling area should be advertised.

Admittedly, this program is not inexpensive. But it is most necessary if maximum returns are to be realized from the sizeable investment involved.

Many larger companies are adopting machine billing and mark-sensing of toll tickets which also present problems of subscriber education and acceptance. In most cases, customers receive less detailed toll statements, especially in cases where toll tickets have been mailed. Larger PBX customers usually require extension identification of calls and this can and should be provided. In 2L/5N exchanges, identification of called points is complicated because numerals instead of letters appear on toll statements. Translation lists should be available in business offices and should be provided to customers.

Because of its multiple advantages, All Number Calling (ANC) is being adopted by many companies in their long range planning. The change from 2L/5N to ANC presents problems which are being handled in various ways. When an exchange is converted from manual to dial operation, the change to ANC can be made without difficulty or added expense because all numbers must change in any event. The same is true when a present dial exchange with four, five or six digit numbers is converted to a seven digit system. However, most companies are taking a "go slow" attitude toward conversion of present 2L/5N systems to ANC.

In many cases the 2L/5N systems are comparatively new and customers have but recently made the adjustment of changing their telephone numbers. From the telephone company's standpoint, considerable expense is involved in resetting directories. So while most companies have made the decision to change eventually to All Number Calling, it appears that the transition will not be completed for several years.

In the meantime, many companies are making the change on a day-to-day basis. All numeral numbers are assigned and listed in the directory on install, move-install and other orders which establish or change a telephone number. A combination of letter and numeral prefixes are then listed in the directory until the final change to numerals is made. This plan has received satisfactory acceptance from customers and saves considerable expense in the directory change.

In all cases where numbers are changed, the customers should receive ample advance notice—one year is not too much—and employes should be briefed in all public relations aspects so that questions can be answered properly.

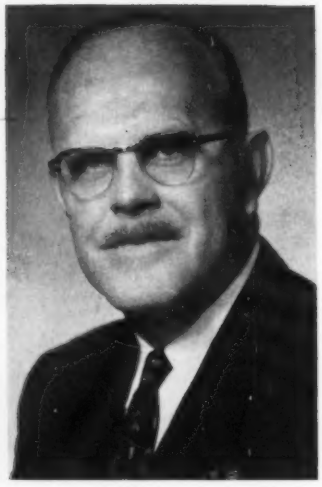
This is not intended to cover the program in detail but rather to indicate to Independent companies that they may avail themselves of USITA assistance through this committee. Experience is being accumulated and can be used as a safe guide.

We urge strongly that the two papers given at the USITA Commercial Conference section of the convention on Oct. 10, be read carefully by those contemplating Direct Distance Dialing and All Number Calling. (See addresses by Paul H. Kaufman and D. A. Perigo in this issue.) The information contained in these speeches is based on actual experience and can be relied on as a basis for procedure.

Inquiries directed to the USITA for assistance will receive prompt handling.

The Makings of Man

"Character is so largely affected by associations that we cannot afford to be indifferent as to who and what our friends are. They write their names in our albums, but they do more, they help make us what we are. Be therefore careful in selecting them; and when wisely selected, never sacrifice them." —M. HULBURD.



Direct Distance Dialing With Emphasis on Commercial Features

By PAUL H. KAUFMAN*

(A Commercial Conference Address)

SINCE OUR presentation today is actually a case history it seems appropriate to present a few background facts concerning our experience with Direct Distance Dialing. I do hope you will pardon my pride when I relate the accomplishments which have been made in this field by the company with which I have had the pleasure to be associated for a good many years.

Northern Ohio Telephone Co. has been one of the leaders in this ultra modern telephone service. Our first installation was made more than three years ago, and I might say, parenthetically, there were not many in existence in the Independent industry at that time. This installation, which was made at Medina, O., was of the BD type and at that time served 16,000 stations through seven exchanges. It was an entirely new installation—new exchange building and new central office equipment, included SATT equipment.

On Aug. 7 of this year we added another one of our toll centers to the network of Direct Distance Dialing. The last group included Norwalk, O., and 10 additional exchanges serving approximately 23,000 telephones. To provide the new service in this case we recovered building space previously rented to others to gain additional floor space and added the SATT equipment and additional trunks between our tributary exchanges. A third toll center is now being readied and present plans call for the inauguration of Direct Distance Dialing for five additional exchanges early in 1961.

At present 19 exchanges with approximately 39 per cent of our 117,000 stations are provided with this latest marvel of communications—Direct Distance Dialing—and so we feel that we have every right to be proud of our progress in this field.

The program of subscriber education in connection with this new service is one of the most challenging and important programs which has ever been encountered by any telephone company. First of all, it is a natural for publicity and good public relations. It attracts interest of practically every telephone user. Then, too, I would remind you that the conversion to Direct Distance Dialing is quite different from any other conversion. For example, when you convert from manual to dial service you instruct your customers as to the use of the dial and the new service. Actually, though, they have to learn how to use dial service, for on a certain date they must use it or do without service.

This is not the case when you provide Direct Distance Dialing. You spend thousands of dollars to provide a new and improved service, but the operators are still at the switchboards, the customer can continue to place his calls as he has in the past and if he does that, your investment is of reduced value. This is the strongest argument I can present to impress upon you the importance of a well-planned educational program, one which will make the subscriber realize the value and convenience of the new service to him and want to use it.

At the same time it affords a wonderful opportunity to build better public relations with the customers you serve. The program for your educational plan should be worked out just as carefully as the equipment and traffic questions which are a part of the establishment of Direct Distance Dialing.

This discussion will be confined to subscriber and employe education, advertising, and publicity in connection with the inauguration of Direct Distance Dialing and, as mentioned previously, is really a case history, or record of what our company did. I would not leave the impression that training the commercial, traffic, accounting and equipment personnel is not necessary. That is far from the truth for they will need specialized training in the new methods which accompany Direct Distance Dialing.

We, at Northern Ohio Telephone Co., developed a program which we thought would do the things necessary for a successful introduction of Direct Distance Dialing. It is not the result of any one person's thinking but cooperative planning by all responsible for the operation of the company. Actually there are three parts to the plan:

(1) Preliminary announcement of the coming of Direct Distance Dialing.

(2) Two months intensified program in advance of conversion.

(3) The post-conversion program.

First of all, let us consider the preliminary announcement. Perhaps you are building a new building, remodeling or adding to an existing building, and if so your news release concerning the activity at the telephone building will include the reason for the work being done and Direct Distance Dialing will be mentioned without any specific date. It is highly probable that this announcement will be far in advance of the coming of the new service and may not attract too much attention.

*Mr. Kaufman is Director of Public Information of Northern Ohio Telephone Co., Bellevue, O.

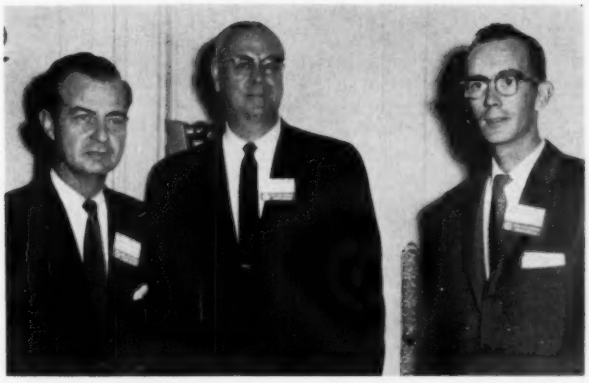
This phase of your program does, however, include a very important part of your over-all program—employe education. Actually we might spend all of the time allotted us talking about the importance of well informed employes.

I often recall a time when I appeared before the service club in a community we served with an unattended dial exchange. My introduction went something like this, "We are pleased to have with us this evening a representative of our telephone company. We do have telephone service, we use it every day; occasionally we see telephone trucks, and with regularity we are mailed statements, but it is very rarely we see anyone from the telephone company."

This is one of our great problems—we are losing contact with our subscribers. An ever-increasing number mail their payments to our business offices and the repairman or construction workers are about the only representatives of the company the subscribers ever see.

Fortunately most telephone employes are good citizens, and they meet many of our subscribers at church, over the backyard fence, at civic and fraternal affairs. To the people they meet, *they are the telephone company.* The subscribers expect our employes to know all of the answers to their questions and problems. The employes are ambassadors without portfolio, and they may create a great deal of good will—or the opposite may happen. It is not only important, but it is our responsibility to make certain that our employes are well informed. When they are able to answer questions, to make known plans of the company, it increases their prestige among their friends and acquaintances, it instills pride in their association with our industry, and makes them better employes.

It is our desire that all employes know our plans before specific information is made public. To accomplish this we arranged a series of meetings which were attended by all employes, regardless of the department in which they are employed. They were given detailed information not only of plans, but also as to the actual operation of the service from the subscribers' viewpoint. They heard every conceivable question, and the correct answer before they left the meeting. It might be added at this point that these questions and answers were prepared by the department heads of our company. The employes appreciate being informed, it made them feel as if they were a part of the "team." . . .



Left to right: J. H. Shultz of Rochester, Ind.; K. L. Lawson of Lincoln, Neb., and E. C. Mercer of Rochester, Ind.

The second phase of "Operation Direct Distance Dialing" is the two months preceding the establishment of the service. Of course, this time table may vary some, according to the number of exchanges which are to be converted to the new service. It might require a week or two more, or less. In this phase, we include our advertising program which is designed to explain all phases of the operation of Direct Distance Dialing. In addition we use weekly releases in our newspapers, reporting the progress which is being made and don't forget that old saying—a picture is worth a thousand words. Our releases include pictures of some activity in connection with the new service and create interest in the program.

It is during this period that we visit our PBX and heavy toll users, and present programs to every club or organization that will invite us to meet with them, and we actually ask for invitations. For these meetings we prepared two programs, one which could be presented to service clubs where very often 20 minutes is all of the time allotted, and a second one which could be used when more time is available.

The lectures were demonstrations and dealt with the over-all plan of Direct Distance Dialing, how to use it and also explained how subscriber's statements would be prepared. In scheduling these meetings, we included city and village councils and the schools among the first. As for the councils, it is a matter of courtesy, and in the case of the schools we recognize that these young people are the telephone subscribers of tomorrow. More than that, carrying the message home helps create interest among the parents. We know some parents attended meetings because of their children. It is our opinion that the programs presented to the various organizations such as service clubs, civic, church and farm groups was a most important part of the educational program.

As to the advertising, we used simple homespun ads which we called "THE TELEPHONE STORY." They are all planned in advance and each one deals with some particular portion of the operation of Direct Distance Dialing. We use them for educational purposes and depend upon our news releases to attract interest and create a favorable reaction toward our company. As we approach the time for the new service we hold a second meeting with all employes. This might be termed a "refresher" course. We want to be sure that all employes are in a position to answer any questions they might be asked.

During the last two weeks before Direct Distance Dialing goes into operation there are three mailings to each subscriber. The first is a leaflet and a dial sticker to be placed on the telephone. The dial sticker contains the new number and the Direct Distance Dialing code number. I am sure that many of you are familiar with these stickers which can be placed over the existing dial plate without removing the one in use. The leaflet explains that the telephone number is being changed to conform to the nationwide numbering plan which is necessary when Direct Distance Dialing goes into operation. It also tells about the faster and more convenient service which they are soon to receive. Perhaps it should be mentioned at this point that we have had excellent results in the use of the dial sticker and it certainly saves a great deal of time and expense.

The second mailing is a personal directory which contains complete information as to the use of Direct Distance Dialing, list of dialable points in the home dialing area, and a list of cities and area numbers from the most frequently called points in all parts of the nation. In the case of our Medina area, we mailed to all subscribers a second or revised list of points in their home dialing area and in other parts of the country a year after the service was placed in operation.

The third mailing was, of course, the

new telephone directory. It contains information pertaining to Direct Distance Dialing, but we relied for the most part on the booklet which was the second mailing delivered about one week before the date designated as "DDD" Day." The directory was delivered only a few days before the conversion date.

The day before "DDD Day" we invited our editors to the toll center exchange and gave them a "sneak preview" of the new service, allowed them to make a call by this new method. We were given some nice stories about the service and I am sure that this act did not hurt our standing with the press. And then comes the long-awaited day —Direct Distance Dialing has arrived but our work is not yet completed. We wonder, will they use this new service? Will they like it? Would they like to see all of the equipment necessary to provide the service? So it is decided to hold an Open House.

At the open house the equipment has appropriate signs which tell just *what* it does, and may I emphasize we do not try to tell *how* it does it. People are interested in knowing *what* the equipment will do, but not *how* it is able to do it. They are also impressed by the tremendous amount of equipment necessary to provide modern telephone service.

It is a good time also to prepare exhibits showing the part IBM equipment plays in this operation. And it is always appropriate to exhibit the equipment which we have to sell, the equipment which makes good telephone service even better. It is another subject entirely when we think of Open House, so I am merely mentioning it as being worthwhile after the inauguration of Direct Distance Dialing.

After cut-over to DDD, we planned a series of ads which point out that this new service is faster, and it is cheaper—three calls for the price of two. These ads were prepared through use of the facilities of Telephone Advertising Institute and were a part of the post-conversion program.

This is also a good opportunity to secure fine feature stories showing prominent persons using Direct Distance Dialing and commenting on its value to them.

I am sure the question in your mind is—"How well did the program work for you?" I once asked a public relation expert, "How do you know whether or not you are being successful when you are dealing with intangibles?" His answer was, "Perhaps you can't tell if you are being successful, but you will certainly know it when you make a mistake."

Left to right: W. F. Miller of Des Moines, Ia.; Mrs. James R. Gerow, Las Vegas, Nev., and Mr. Gerow.

I believe you can evaluate what has been accomplished in an educational program such as we have been discussing. The answer lies in whether it is being used, what people think of it, and does it increase the use of long distance service. Bear in mind that we are presently providing Direct Distance Dialing for station-to-station calls only. Here is our experience. At Medina, after one month, 40 per cent of all toll traffic was completed by subscribers dialing directly. After three years of Direct Distance Dialing, 69 per cent of all toll calls are being dialed by the subscribers. The percentage varies by exchanges from a low of 52 per cent to a high of 83.7 per cent, with the average 69 per cent.

In our installation at Norwalk, which has been in operation only two months, the percentage of all toll traffic dialed to completion by subscribers was just over 48 per cent at the end of the first two weeks, but has now, at the end of seven weeks, reached 56 per cent.

In the case of Medina, we did not keep a record initially of the percentage of dialable calls which were dialed by the subscribers, but we are keeping such a record at Norwalk. This record shows that the subscribers are completing 88 per cent of all dialable toll calls. And this certainly is evidence that people like the service and are using it.

It has long been recognized that the better the service, the easier it is to use, and the more people will use it. In the case of Medina, however, the figures do not tell the entire story, for this city, in the highly developed industrial area of northeastern Ohio, has had phenomenal growth and an extremely high rate of toll usage. Even so, the increase of toll usage since Direct Distance Dialing went into operation in that area is 4 per cent above the increase in the other areas in which we operate. There is every reason to believe Direct Distance Dialing will produce a higher percentage of increase in most other areas.

Now I would like to summarize a bit and emphasize some of the important phases of the program. We repeat—the success and acceptance of Direct Distance Dialing depends to a great extent upon subscriber education. You may find better methods than we have outlined, but consider it carefully and make certain that your subscribers are informed about the value and use of the service. Emphasize that it will save them time and money. Be enthusiastic in discussing the service —some of your enthusiasm will "rub off" on the people with whom you are talking.

You may have noticed in this discussion I have not referred to Direct Distance Dialing as DDD. In our first experience with the service we thought it important to emphasize the importance of dialing the DDD code number first because that connected the subscriber with the Direct Distance Dialing equipment. Some subscribers took us literally and attempted to complete their calls by dialing the letters DDD and, of course, failed in their attempts.

Since then we refer to the new service as Direct Distance Dialing. We are also glad to see the changes to All Number Calling, for some subscribers thought the name was being abbreviated and did not approve of the first two letters which were a part of the telephone number. Here is an example of what I mean. One exchange was given the name PARK which meant the prefix was PA. Some subscribers insisted it should have been PK. I am sure all number calling will be a decided improvement over the 2L-5N numbering plan.

We can all be assured that Direct Distance Dialing will become almost universal within the next few years. It is part of a program which has for its goal that some day, from any telephone we will be able to dial directly to any other telephone in the United States. Yes, and in the not too distant future, we will be dialing directly to telephones in foreign lands. It is well for us to look to the future and to plan for Direct Distance Dialing. And, remember, your education and public relations program is of the utmost importance for it will make it possible for both subscribers and companies to derive quickly the maximum benefits from Direct Distance Dialing.

Commercial Aspects Of All Number Calling

By D. A. PERIGO*

(A Commercial Conference Address)

ALL NUMBER CALLING should arouse three points of interest in the commercial department. The first is that since directory expenses are a commercial item of control, the economics involved in the decision as to when and how the transition should be made is of primary importance. You will notice the remark was "when and how" which leaves no doubt as to whether it will be used. There seems to be no other answer at the moment, than to agree that it will be done.

You might be interested in the attitude expressed by the (USITA) Traffic Committee after a full discussion of the subject a few months ago. I'll quote from that committee's report to the board of directors of USITA:

"The Traffic Committee completely endorses the theory of All Number Calling. It recommends the adoption of ANC at the time of dial conversion or when total number changes are required for equipment reasons. Where 2-5 numbering is already in use, this committee believes that a gradual shift to ANC by using it for new connections is the economic way of accomplishing the result. In all cases this committee recommends that a sound public relations program be set up to give the public the full story before any changes are made."

In further consideration of the directory economics, I would think there would be no question when it is necessary to change to all numbers. With the gradual shift from 2-5 by using ANC on all new connections, there does come a time when a decision must be made as to when and how to change the remainder. The gradual shift will do nothing for the old-established business customers. Should they all be done at once or should they be done a few at a time as new directories are published? I feel that this question must be answered by each company, and I further suggest the answer may be different in the various exchanges of the same company. For example, in the current issue of the Chicago directory a few numbers have been changed—so few it might take a lot of searching to find one—so I'll give you a clue. One of them is the Illinois Bell Telephone Co. I think that gives you another clue also, and that is—by all means make sure the telephone company numbers are the first to be changed.

I believe there are two other commercial aspects that require attention. One is to inform the public in advance —plenty of advance—and the other is to be sure all employes know the story and what is in back of All Number Calling.

This is where I saved preparation time because the remainder of this talk is one which has been prepared to take care of a large part of these two items. It was prepared for use with employes, chambers of commerce, service clubs, and schools. Obviously news releases and advertising tie in with the talk.

Newspaper columnists express themselves in many ways. Sometimes a column is informative, sometimes humorous, and often full of innuendos. Probably too often the average reader attaches significance to a column which the columnist never intended. For example, one columnist in discussing All Number Calling said: "I think the President should step in and tell the telephone company it can't make the change." Undoubtedly there are people who will remember only that sentence. This is so easy to misquote that unless the telephone company is extremely careful about informing the public, what eventually happens is this:

First subscriber: "I understand the telephone company is going to change all our numbers to seven digits."

Second subscriber: "Don't worry. I saw in the paper where the President told them they can't do it."

Actually the columnist's entire final paragraph reads this way:

"I think the President should step in and tell the telephone company it can't make the change. It's his business to look after the welfare of the country, and to burden the citizens with seven numbers to remember at a time like this, is to add to the burdens."

Frankly, I personally enjoyed Henry McLemore's column on this subject but at the time I recognized some problems that could develop as a result of its publication.

I happen to be in the telephone company's traffic department and it is our responsibility to get the calls through to completion—and I should add correct completion.

Telephone operators in local manual exchanges are well aware of the fact that many wrong numbers are reached because the *calling party* gave the operator the wrong number. They also are aware that when the calling party discovers the mistake he says to the called party, "I'm sorry. *She* gave me the wrong number."

Strangely enough, people became so accustomed to excusing their own mistakes by blaming some one else, that after the office is converted to dial and the customer completes his own call by dialing a wrong number, he still says, "*She* gave me the wrong number."

Now back to Mr. McLemore's column. He bases his case on the fact that people aren't able to remember seven digits. To this we say that people do not remember *any kind* of numbers. Mr. McLemore's column presents a good argument for people to use the directories which the telephone company publishes and also to use the blue books for recording frequently called numbers.

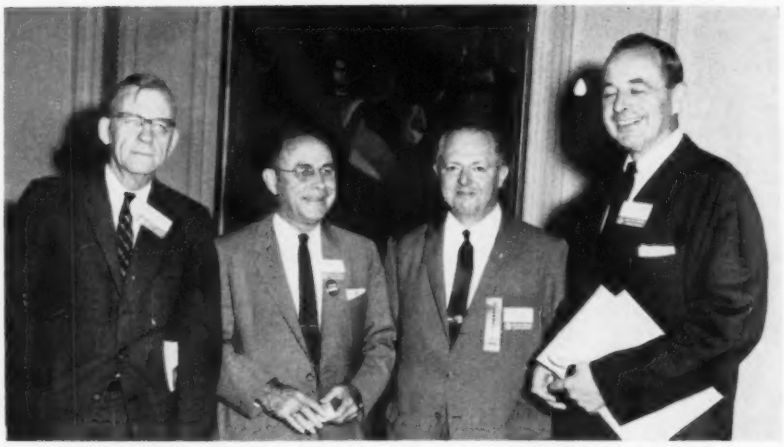
I think we have demonstrated that we have some problems in understanding. That is the reason for laying the cards on the table to tell you exactly what is going on—why we use All Number Calling in some places but not in others.

Each telephone number that is used with Direct Distance Dialing in either direction, or both, actually uses a four-digit central office number. This number is preceded by a central office code of three characters. For long distance calling from other areas there is also an area code of three digits. That sounds fairly simple except that it involves a total of ten digits, so you ask, "What's wrong with the present system? Why change it?"

*Mr. Perigo is General Traffic Superintendent of West Coast Telephone Co., Everett, Wash.

Frankly, there is nothing wrong with the present system as of right now. The reason for changing it is because it will not take care of future growth.

It was only a short time ago that the 2-letter 5-digit number was considered to be the last word in telephone numbers for the foreseeable future. In 1947, it was adopted as the plan to be used for Direct Distance Dialing. At that time the United States and Canada were divided into Numbering Plan Areas—a total of 86 of them. Generally speaking, these areas covered a state or a province although some of the more populous areas required more than one area. The area codes contained the middle digit of either "1" or "0" which prevented any confusion with central office codes since there are no letters on the "1" or "0" dial pulls except the infrequently used "Z."



Left to right: R. E. Daniel of Warsaw, Ind.; Clark Mull of Knightstown, Ind.; Keith Vogt of St. Paul, Minn., and Wesley H. Loomis III of Des Plaines, Ill.

Because of the need for special codes, and arithmetic being what it is, there is the possibility of having 152 of these area codes. In 1947, then, we can see that only 56 per cent of the available codes were in use. From then to Jan. 1, 1960, however, it became necessary to use 31 additional codes, or 77 per cent were in use. The state of California, for example, started out with three area codes and now has eight.

What has caused this situation? Growth! To emphasize how much growth, let's consider some figures. The telephone systems of the United States and Canada are growing at the rate of about 350,000 telephones a month. When we consider 10,000 as a central office unit we find that 35 additional central office codes are required every month.

Any central office code may be used only once in any numbering plan area, otherwise there is a duplication of numbers which, of course, would be an impossible situation.

Perhaps you noticed that I slipped rather glibly from numbering plan area codes to central office codes. This was deliberate to emphasize the reason for using the additional NPA codes. One such reason is because of the limited number of central office codes. When we start running out of central office codes all we can do is start another numbering plan area.

Why are there such restrictive limits to the central office codes? The use of central office names eliminates some of the possibilities, due to the difficulties in connection with phonetics, spelling, etc. The 2-letter 5-digit system allows only 540 central office codes, but All Number Calling increases this to 800 or almost a 50 per cent increase in every numbering plan area.

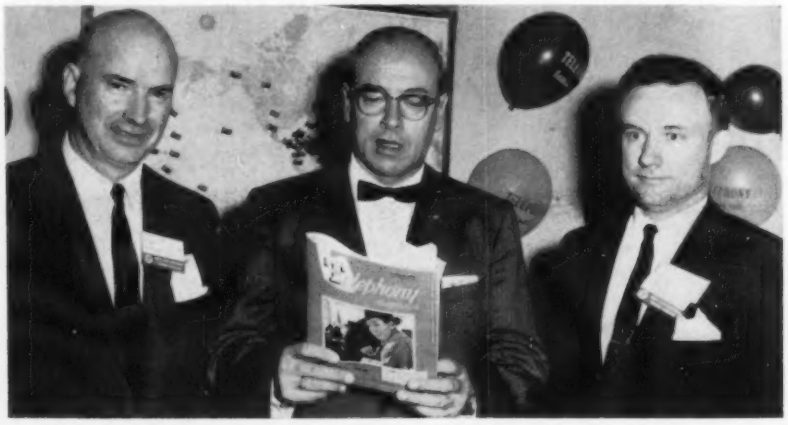
We are looking toward direct indialing to PBX stations, direct dialing to personal signalling sets and to mobile services. These items will use up a lot of central office codes—but will improve our service to the public.

To this point we have been talking almost exclusively about the arithmetic of the call number situation. Let's sum it up briefly. Due to the growth in number of telephones, we need more area codes and more central office codes to continue using a basic system of seven characters locally plus three outside the numbering plan area. Unless this is done we would require either eight characters locally or four for area codes—or both.

Now suppose we decided to go to eight digits locally. As far as toll is concerned this would mean eliminating such an office from the customer dialing network or that every number throughout the country must be changed to eight digits at the same time, an impossible situation. This is because, at the moment, the equipment would recognize only the first seven digits—so the calling party would get nowhere.

There are other considerations. Let's first look back to our newspaper friend's comments about remembering seven digits. Actually what really happens is that the subscriber will need to remember only the last four digits individually; the first three are remembered as a unit, such as 222 instead of CA2. This has not been a hit or miss decision. Actually tests show there are fewer dialing errors with All Numeral Calling than with the 2-letter 5-digit system.

One of the reasons is because people —both customers and operators—are notoriously poor spellers in this generation. For example, there are people whose spelling causes them to dial MU instead of ME for Mercury—or UK instead of YU for Yukon, VY instead of VI for Viking. We could go on but these examples indicate how a lot of wrong numbers come about. An all-number system would eliminate this problem.



Left to right: Leith Johnston of Northlake, Ill.; K. C. Gillette of Chicago, and D. C. Cherrick of Washington, D. C.

You have noticed, of course, that many customers now use only the first two letters of the central office code on their stationery, statements, billboards, trucks, etc. This is probably to conserve space and reduce costs. At any rate, we find that customers are now using only the two letters when passing calls—and not to be outdone, the telephone companies have gone along with the idea. It follows that if only two letters are being used it is not necessary to have names, since any two letters could be used. For example, we might use JK, KK, or WW. As a matter of fact such an arrangement is now in use in a few offices. This is because plans were too far along at the time All Number Calling was officially announced as Bell System policy.

Use of only the two letters, however, leads to some problems in understanding. We can agree there should be no confusion between Temple and Cedar, but when those names are reduced to TE and CE it develops a regular merry-go-round of trying to distinguish which is which when they are spoken. When word is left to call TE4-1212 and the message is taken as CE4-1212 the call is completed 234-1212 instead of 834-1212. Phonetically speaking the central office names were satisfactory but use of abbreviations developed phonetic difficulties.

Possibly one other point should be made. Some time in the future, international dialing will become a reality. Most nations use the same digits—but when it comes to letters it would be next to impossible. Suppose you wanted to dial a Japanese number which used a central office name? You can see what you would be up against in trying to dial it from your telephone using the English alphabet. On the other hand, the Arabic numbering is practically universal. Other countries number their dials the same as we do. This, however, is not true of the letters. In Denmark, for example, the "2" is also ABD instead of our ABC. They put the "C" with the numeral "1"—and this, of course, makes the remainder of the alphabet inconsistent with American dials. In England, they have overcome the confusion between "O" and "Zero" by removing the letter "O" from the "6" position and placing it on "Zero."

At the moment, I would suspect you have very little interest in whether you can dial direct to England, Denmark, or Japan—but would you deny the future possibilities. The physical possibility of doing this is close, but we doubt if the world will be ready for it by the time the telephone systems are.

As subscribers of ours we feel you are entitled to know why we are changing in some places but not in others.

Left to right: Mrs. M. E. Vail of Springfield, Mo.; Mrs. G. M. Kimball of Fryeburg, Me.; and Mrs. H. A. Utech, Warwick, N. Y.

We are in a long-range program. We have an obligation to our customers to operate our business as economically as possible. Resetting directories is a costly item. Changing number plates on all telephones also runs into money. Let's put it this way. There is no question about the future necessity of All Number Calling. It, therefore, follows that each company should make the change at the time and in the way that is most economical and in the best interest of the customer.

This means that when an office is converted from manual to dial operation is a good time, because all numbers must be changed anyway. Another good time is when we change from terminal-per-line to terminal-per-station equipment. In some places, it may be good sense to make changes as new telephones are connected. Over a period of years this would take care of a high percentage and minimize the directory reset charges.

We have one exchange in which there are three central offices. Two are terminal-per-station with 2-letter 5-digit numbering, while the third is terminal-per-line with 2-letter 5-digit numbering. We are replacing this office and converting to terminal-per-station. We will use All Number Calling completely in this office. The other two will be changed as new connections are made.

The change-over from 2-letter 5-digit numbering is not required now or in the immediate future. Where we have such a system and there are no equipment reasons for making a lot of changes we expect to continue for some time in the future. Such exchanges will probably be done on a gradual basis but no plans have been made as of now.

You may be sure of one thing. When you have a seven-digit number and the first three represent your central office code you know that your exchange is ready for the future.

There is one word of caution, so no one gets the idea a promise is implied in any of these remarks. We are talking about a numbering *system* not individual telephone numbers. There may be times in the future when for the benefit of the service we may find it necessary to change your number even after All Number Calling. This is a normal part of the business, which will continue with us for the indefinite future.

There are many barriers to communication. Language is one, personal belief another—but the barriers are so acute that even accent interferes when speaking the same language. All that is needed to show this is the difficulty an operator from the northwest and one from the southeast have in understanding each other. To the northern operator, the other operator has such a "southern accent" she can scarcely understand her—and to the southern operator the other operator talks just like a "damn Yankee."

We know that operator toll dialing, which made it possible for the originating operator to dial direct to the terminating number, eliminated many misunderstandings. Perhaps All Number Calling will someday help on an international basis.

The commercial aspects of All Number Calling are (1) the directory expense economics of how and when to change, (2) well-instructed employes, and (3) an adequately informed public in advance of the changes.

Report of USITA Engineering Commitee

By A. A. WILSON, Chairman

THE ENGINEERING Committee, consisting of the main committee and the six sub-committees, has completed another busy year. We feel the results are most gratifying and are set forth as follows:

Main Committee. A joint meeting between the Engineering Committee and representatives of the Bell System was held in New York on June 14 and 15, 1960. The purpose of this meeting was to continue the coordination of engineering matters affecting the Independent industry and the Bell System.

Representing the USITA in addition tc the main Engineering Committee at this meeting, were representatives of the engineering sub-committees on Direct Distance Dialing, Transmission and Protection, and All Number Calling. There were about 20 representatives from the AT&T company participating at various times during this meeting. The subjects discussed at this meeting consisted of the following:

PBX in-and-out toll dialing.
Person-to-person, credit card, and special charge calls on DDD.
NPA information bureaus.
All Number Calling.
NPA codes.
Closed circuit TV.
Buried cable and wire.
Engineering standards for terminal trunks.
Data-Phone service and facilities.
Line switching.
TWX mechanization.

It is planned to issue engineering bulletins similar to the bulletins which were issued last year to cover the subjects discussed. These engineering bulletins would amend the previous bulletins in some cases and, in other cases, would be new bulletins to cover subjects not previously included in the bulletins. It is felt that this meeting was very successful and the entire telephone industry benefits greatly from discussions of this kind. . . .

The chairman of the Engineering Committee participated with a representative of the Commercial Committee and one from the Marketing Committee and representatives of the Bell System in New York on Feb. 16, 1960, to discuss the latest developments by the Bell System concerning Data-Phone service.

It was brought out at this meeting that the Bell System feels the demand for Data-Phone service has now reached the point of rather rapid development and they are of the opinion that it is of the utmost importance that telephone companies have necessary facilities available so that the Data-Phone service can be handled over the telephone network as a part of the telephone services.

This Data-Phone service would obviously affect the Bell System to a much greater extent than the Independent industry, but it is necessary for the proper committees of the USITA to make a study of this matter to determine the degree of participation required on the part of the Independent industry. The Bell System anticipates that they will have about 500 of the high speed Data-Phone subsets in service by the end of 1960 and an additional 2,000 in service during 1961. A more detailed report of this meeting has been submitted to the USITA office in Washington.

The chairman of the Engineering Committee also represented the USITA at a Wire and Cable Industry Meeting held in Washington, D.C., on Dec. 15 and 16, 1959. The purpose of the meeting was to discuss proposed revisions in the REA specifications for cable, buried wire, multi-pair distribution wire, and station wire.

As a result of this meeting REA representatives stated that they would review the discussions and objections presented and possibly make changes in their proposed specifications. A report of this meeting has also been submitted to the USITA office. The Engineering Committee expects to keep in touch with the developments on this matter in order to keep the Independent industry fully informed of these developments.

The Engineering Committee and the Plant Committee collaborated in the study of "Standards for Polyethylene Insulated Thermoplastic Jacketed Communication Cables" as prepared by the Insulated Power Cable Engineers Association. A joint report of the engineering and plant committees was submitted to the Insulated Power Cable Engineers Association covering the results of this study. A copy of this report was also submitted to the USITA office in Washington.

The Engineering Committee is investigating the matter of arranging for the publication of an index for technical papers issued by manufacturers and suppliers. It is anticipated that much more up-to-date and timely information would reach the various operating people as well as substantially reduce the labor of the various committees. This matter is now in the early stages and will require some time for full development.

The Engineering Committee expects to continue to study and keep abreast of specific engineering problems and developments and to keep the Independent industry fully informed on these matters.

Sub-committee on All Number Calling

A new engineering sub-committee on All Number Calling (ANC) was established in May of this year. It was decided that this new sub-committee was needed in view of the many developments that are occurring in connection with conversion to all-numeral telephone numbering and the need for Independent telephone companies to be kept currently informed. All number calling was discussed during the joint meeting in New York on June 14. The Bell System strongly recommends ANC in connection with new conversions or with changes from present four and five-digit dial offices to seven-digit offices. However, the operating companies can make their own decisions in regard to ANC and they should feel under no pressure on this matter.

We won't attempt here to list the many advantages and reasons for ANC, but the AT&T has issued a booklet which covers this subject most comprehensibly. This is a yellow booklet issued in February 1960 and it is understood that this booklet is available to the Independent companies which are interested. It can be obtained through the Bell-Independent Relations Manager of the various Bell associated companies.

Sub-committee on Direct Distance Dialing

During the joint meeting in New York between the Engineering Committee and representatives of the Bell System on June 15, 1960, the AT&T announced plans for the mechanization of TWX service. They stated that they were anxious to proceed on this matter as rapidly as possible with a tentative completion date sometime during the fourth quarter of 1962.

Left to right: A. J. Stults, TELEPHONY's advertising manager; B. E. Simonson of Arlington, Va., and R. B. Wiseman of Elkhart, Ind.

Briefly, this means that the TWX customers will dial their own connections on the same basis as dialing a telephone call. Subsequent to this meeting, AT&T suggested the assignment of a USITA engineering sub-committee to work with its representatives on the various problems involved with the TWX mechanization.

It was felt that TWX mechanization would come more closely under the activities of the Sub-committee on Direct Distance Dialing with perhaps the assignment of additional technical personnel from time to time to assist this sub-committee on a consulting basis.

A joint meeting between this sub-committee and the TWX Mechanization Coordinating Committee of AT&T to discuss this matter will be held late in September in New York. The preliminary phases of the matter will be covered and the over-all plans of AT&T in this connection will be outlined at this meeting. Arrangements will also be made for future coordination as plans are developed.

The agenda for the remainder of this meeting will be as follows:

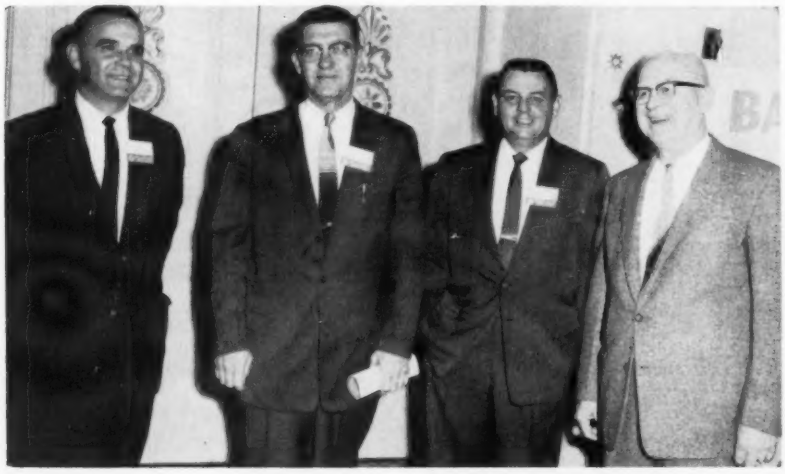
(1) Person-to-person customer toll dialing.
(2) Automatic number identification for Independent tributaries of Bell toll centers.
(3) New nationwide numbering plan.
(4) All Number Calling.
(5) Toll ticketing systems for PBXs.
(6) Changes in toll rate structure that might affect customer toll dialing systems.

Other items are likely to be covered at this meeting. In fact, it is expected that this meeting with the Bell people will give them a chance to disclose some of their latest thinking on long-range customer toll dialing service.

The director of this sub-committee had the privilege to attend the meeting of the Engineering Committee with AT&T personnel in New York on June 14. This meeting offered an opportunity to obtain latest Bell System thinking on the following subjects:

(1) PBX in-and-out toll dialing.
(2) DDD for person-to-person service.
(3) NPA information bureaus.
(4) All Number Calling.
(5) Numbering plan area codes.

A memorandum covering this information has been distributed to all members of the Engineering Committee and the sub-committee on DDD.



Left to right: Robert S. Yeago Jr. and Dennis Draper, both of Staunton, Va.; Don K. Carlson of Morenci, Mich., and R. J. Schafer of Pinconning, Mich.

Sub-committee on Engineering Education

This committee arranged for the fourth annual Telephone Engineering Conference at Michigan State University, East Lansing, Mich., which was held July 3 through July 22, 1960. The 1960 Engineering Conference was very successful. A total of 64 men attended the program, the largest class to date.

During the past four years, a total of 191 men have participated in the conference.

The 1960 program was patterned very closely after the 1959 conference. All members of the faculty were new with the exception of Dr. Gruehr of the Polytech Institute of Brooklyn. Dr. Gruehr did an excellent job of handling Cost Considerations and engineering decisions. He coordinated his instruction with that of J. E. Coffman, exchange planning engineer of General Telephone Service Corp. of New York, who taught Engineering Fundamental Plans.

Fundamental Economic Concepts was taught by Dr. James B. Hendry, assistant professor of economics at Michigan State University. The subject of Communicating Engineering Decisions was handled by Dr. Hideya Kumata, associate professor at Michigan State. The graduation address was given by Paul Henson, executive vice president of United Utilities, Inc.

Comments offered by the students and faculty indicated that this was the most successful Telephone Engineering Conference experienced to date. In our opinion, these conferences should very definitely be continued.

Sub-committee on New Techniques and Devices

This sub-committee has continued its study of new developments and will keep the Independent industry fully informed. In connection with its study of electronic switching, the committee has been in touch with the various manufacturers of this equipment and while they are active, there is no evidence of much progress in this field during the past year.

The director of the sub-committee has been busy also in promoting indialing to large PBX systems. Several systems have been mechanized and the results are most gratifying. The committee has also inspected new dial installations which permit dialing of person and collect calls on DDD.

As the investigation of these matters is completed, detailed reports will be prepared for distribution to member companies.

Sub-committee on Radio and Carrier

One of this sub-committee's duties is the study of FCC proposals pertinent to telephone companies, with recommendations for association action when need is indicated, as well as participation in such action as may prove desirable. This phase of its activity has been relatively light this past year.

However, the sub-committee has been deep into continuation of the dial mobile (narrow-band) study initiated and reported last year. This study, with the Bell System actively represented, has developed a "Tentative Proposal" which presents system requirements and characteristics in some detail, especially those necessary of agreement for universal use to provide compatibility between dial mobile systems throughout the telephone industry.

This "proposal" represents the telephone industry viewpoints, including commercial, traffic and engineering; however, the important factors of cost, reliability, and manufacturing and maintenance facility are matters on which the potential dial mobile equipment suppliers can best advise.

Accordingly, the subcommittee has submitted its "Tentative Proposal" to numerous manufacturers with the request that they comment and advise on such of our proposals as they may feel desirable to accomplish the objectives of good balance in economy and performance, while retaining the basic operating characteristics necessary for ready incorporation into public dial telephone systems.

As of this writing, Sept. 1, 1960, the sub-committee plans receipt of the manufacturers' comment by September 7 and across-the-table discussion with their representatives on Sept. 21. This will be followed by sub-committee deliberation on Sept. 22 and such later meetings as prove to be necessary to complete a "Guide for Compatible Public Dial Mobile Systems (Narrow Band)."

It is planned to prepare this guide to assist in purchasing, as well as to offer an educational reference for the telephone company management which is unfamiliar with radio, and also as a reference for suppliers who want to satisfy telephone company (Bell as well as Independent) needs for dial mobile systems.

The cooperation of the association's radio engineer, Thomas Warner, has been an invaluable aid in all phases of the sub-committee's work.

John H. Martin (left) of New Holland, Pa. and J. K. Stoltzfus of Birdsboro, Pa., displaying photographs of old telephone instruments which they have collected.

Sub-committee on Transmission and Protection

During the year this sub-committee has continued its efforts to encourage the formation of Transmission and Communication Improvement Committees or the assignment of the responsibilities for securing improved transmission to existing committees in the state associations. At the present time 15 states have cooperated in this effort. . . .

Efforts are continuing with the pilot South Carolina TCI committee to develop methods of securing improved transmission and of measuring the progress being made. These methods will be passed on to the state committees.

A number of the TCI committees are now holding regular meetings and are furnishing helpful information to the companies within their states. The most effort at present is being directed towards obtaining satisfactory local loops and proper use of high gain sets.

Liaison has been maintained with Bell System representatives in New York in order to coordinate suggestions to the state committees by both branches of the industry.

A meeting of this sub-committee with Bell System representatives was held July 25 in New York for the purpose of reviewing transmission developments. An information memorandum is being prepared covering these discussions and will be available for distribution to member companies early this fall.

During the meeting the group agreed to the joint preparation of a manual on transmission which will cover all aspects of transmission standards including trunks, loops, protection, maintenance, and measurements. It is hoped that this manual will be available to the industry before the end of the year.

Engineering Considerations in Planning C.O. Locations

By CARL HANENBURG*

(An Engineering Conference Address)

AT THE OUTSET it should be made clear that the selection of a central office location always involves other than pure engineering considerations. The decision is based in most instances on a combination of the needs of the commercial, traffic and plant departments which may involve matters ranging from public relations to space for relocation of personnel or from toll, switchboard space to adequate parking space.

Processes Vary

Processes have varied with time and the individual companies, ranging from a simple division of the area geographically to complex calculations of wire centers based on forecasted estimates of industrial and residential growth over certain specified study periods up to and including the ultimate saturation of the area. For our purposes here however we will deal with the basic problems of the economic selection of a central office location as related to plant costs.

The obvious point of beginning is in having the best forecast of customer demand available or, more commonly, the commercial survey. Here it is essential that forecasts be made in increments not to exceed five years to establish the economic time interval for placement on an annual charge to investment basis. This will vary depending on the size and growth of the areas involved.

For example, an area where rapid growth is being experienced and it is conceivable that complete saturation can be anticipated in an interval of, say, 10 years, it is no longer a matter of complex study to determine either location or size, since simple economy would necessitate providing for the ultimate size in major units such as buildings, underground conduit systems and, even to some extent, backbone cables.

Uniform Growth

More common to many of our operations, however, is the situation where growth has been somewhat uniform, although confined to certain concentrated areas and existing facilities are exhausted in both central office equipment and outside plant.

Frequently the growth areas are on exchange fringes where transmission resistance design is becoming a problem. So a new factor of cost comparison is introduced. Should we pay the additional penalty in heavier gauging of wire circuits or should we consider a relief community dial office encompassing part of the exchange area and/or areas of two or more contiguous exchanges?

Consulting the commercial survey will provide the basic answer as to the magnitude of the growth, and the forecast cost of outside plant expansion required can then be calculated. This will be weighed against the long-range forecast for this area and the net cost comparison of the establishment of the community dial office.

At this point, it should be re-emphasized that problems other than engineering have been resolved. In this reference is meant what effect such matters as exchange boundary relocations, Extended Area Service calling options and Direct Distance Dialing will have on customer opinion.

Survey Essential

Having established that installation of an exchange should be based on preliminary cost estimates, it follows that an accurate survey of calling patterns is essential to provide adequate trunking facilities. This, while being a part of the preliminary estimate, becomes important in integrating existing cable facilities for trunking purposes. This survey can also materially influence the type and quantities of central office equipment initially installed.

In selecting the community dial office location, then, the practical approach is to consider (1) forecast requirements on five-year intervals, (2) maximum use of existing facilities and application to the best advantage, (3) immediate relief requirements in existing central offices, (4) distribution cable relief projects to provide primary service to rapid development areas, and (5) optimum gauge benefits as related to extending the minimum of expensive heavy gauge circuits and maximum large size light gauge cables.

Future Service Demand

Taking these points in order let's consider first—the area survey for future service demand. The people making the survey should, if possible, be experienced in the telephone field. Preferably a happy combination of realists with vision and a pronounced tendency toward being practical. They should have their feet on the ground, but at the same time not be inclined to be over conservative. Information on growth patterns should be objectively weighed and corroborated by sources other than developers on a promotional basis. Planning commissions, school district growth forecasts, population research statistics by university survey groups, are normally considered reliable sources of information.

The economic reuse of existing facilities is an essential part of locating central offices. Generally speaking, it fol-

*Mr. Hanenburg is General Plant Engineer of West Coast Telephone Co., Everett, Wash.

lows that an appropriate location will be in proximity to an established feeder cable route. This again will fall near the established wire center in a properly designed plant. It is frequently possible to make use of existing cables for trunking facilities as well as exchange circuits. This can provide advantageous use of heavier gauge cable that will be inherent in fringe area plant design. It should be recognized that existing wire centers based on present distribution of subscribers may differ from locations plotted on the basis of projected growth estimates. This, of course, must be weighed against the estimated time element involved in the wire center shift. Some variation from final wire center selection must be anticipated due to the problem of availability of property at the selected site.

Left to right: R. T. Rayborn of Pleasant Plains, Ill.; Hugh D. Straughn of Oklahoma City, Okla.; Mrs. Rayborn; J. W. Hudson of Aurora, Neb.; Mrs. Herman H. Wagner of Prattsburg, N. Y., and Mr. Wagner.

Second Office Plans

The need for a second office is frequently precipitated by the exhaustion of space and/or switching equipment at an existing office or offices serving adjacent exchanges. The location may be varied to a theoretical wire center, so placed to advantageously relieve the existing primary central office where additional cost would be greater and immediate action must be taken to provide additional facilities.

Addition to central office facilities and buildings under a given set of circumstances can be more costly, on an annual charge basis, than concentrating all switching equipment in a single new exchange building at a centralized location. When, in the customer location forecast, rapid development is anticipated in certain concentrated areas, it is only sensible to plan distribution cable plant to adequately serve this area in the initial plant to be constructed.

Plan for Integration

As it is generally necessary during the planning, engineering and construction stages of projects of this magnitude to provide interim service in congested and rapidly developing areas, it should be emphasized that plant be engineered with the objective of integration with a new community dial office location. It follows that these projects will be based on normal engineering practices in providing growth margins in the immediate distribution areas, and only sufficient feeder facilities to the existing central office to last until the scheduled in-service date for the new dial office.

The reference to optimum gauge benefits in cable extensions specifically entails balancing the forecast concentration of subscribers on a true wire center basis, that is, the accumulated length of the total exchange circuits should theoretically balance in all directions from the central office location. Exchange loop resistance limits must obviously be observed in these calculations although introduction of a limited number of long-line adapters can be tolerated where circuit groups are small. This theoretical wire center split must be ignored, however, if a penalty is being introduced in excessive use of heavy gauge cable.

Detailed Layout Plans

In any decision of this importance, a careful analysis of alternatives must be made. To assure accuracy, and to avoid oversights, a comprehensive layout plan should be originated to make comparisons readily understandable. This is most easily done by a system of districts or areas showing subscribers both on an existing basis and on a projected growth basis. Existing facility maps should be available indicating routing location, and size and type of circuit facilities. Then you can make cost comparisons of possible alternative plans which can be converted to annual charge factors.

Having selected the approximate site for the central office location, investigation is then made of available property. Here the advantage of long-range fundamental planning becomes evident. Selection of possible building sites is best considered years ahead of anticipated need and property acquired while values are not inflated by local building booms. However, assuming that property must be acquired belatedly, inflated cost may conceivably influence the relocation to a less desirable site. It is possible that the cost penalty for such a move may be overlooked by failure to recognize the additional cost to haul plant circuits to the site selected as second choice and having the lower initial cost.

Left to right: Helen Neidlinger of North Liberty, Ind.; F. E. Burkett of Plymouth, Ind.; Mrs. Burkett; Gay Henderson and Grace Hauschild, both of Lincoln, Neb.

Combining Adjacent Exchanges

An adequate study of this nature should include complete investigation into the feasibility of combining ad-

jacent exchanges where single unit installations are in use and expansion to additional units is not practicable. It is entirely possible that the conversion of two or more closely spaced switching units into a single centralized switching machine may have attractive economic installation and operational advantages. This is especially true where exchange loop resistance limits can be increased by means of changing type of switching machine, and where elimination of additional trunk switching results in economy in equipment and elimination of dialing digits.

To summarize, it is noteworthy that in the analysis of the major factors influencing the wise selection of central office locations, the commercial survey is of first and paramount importance. To a large extent the long range economy of the selection is dependent on the accuracy of this survey. This is especially true where wire centers are materially affected. It naturally follows that realistic cost comparison of alternative service plans on an annual charge basis is essential.

Investment Important

It is axiomatic, but bears repeating, that decisions as to investment of capital in plant are of vital importance inasmuch as the plant once constructed must be the source of sufficient earnings to pay off its cost during its lifetime and pay its share of company profits at the same time.

This means that it must not only fulfill the objective for which it is designed but also be able to meet the changing needs of new developments in the future and be flexible enough in design to be added to with future growth.

In a discussion of a subject with the number of facets here involved it is possible only to generalize and lay certain basic ground rules. To the benefit of the industry, under the sponsorship of your association (USITA), the annual Telephone Engineering Management Conference that has been instituted at Michigan State University covers fundamental planning in exhaustive detail. Instructors for this course are very capable men from the telephone industry selected on the basis of their accumulated knowledge and training in this particular field.

Left to right: Mrs. C. T. Moore of Harrison, Ark.; Mr. Moore; Mrs. Paul Kaufman of Bellevue, O., and Mr. Kaufman.

Time Well Spent

Having attended the first conference in 1957, it is my considered opinion that time at this conference is well spent. It is also my understanding that with each succeeding year the curriculum has been refined and condensed to meet the specific needs of the industry. In this reference, it should be said that in addition to fundamental planning this program includes fundamental economic concepts, cost considerations in engineering decisions and communicating engineering decisions.

It has been well established that, in many instances, ideas, plans or projects have been well thought out and properly designed but finally failed to be used profitably simply because the engineer or designer has done an inadequate job in selling his idea. This can apply both to oral and written presentation and surely we have all had the experience of reading a report that, while covering the problem adequately, was either improperly arranged or so complex that it was completely incomprehensible to the person reading it for the first time. Here, also, the engineering seminar can assist your engineer in basic concepts of proper preparation of engineering reports.

Reports Must Be Clear

In conclusion, a general observation on this era of technical development is that perhaps we are all frequently inclined to avoid presenting anything in its simplest form and there is an apparent urge to couch our reports in technical jargon that can only confuse the uninitiated. Even a report such as discussed here on selecting central office locations can become extremely involved and somewhat technical. In this case, you are running the risk of losing the effectiveness of your report and authenticity is questioned where complexity obscures the simple conclusions drawn.

This type of situation may have been the reason behind the origination of the definition that has been frequently plagiarized and altered as the occasion demands which defines the telephone engineer as follows:

"A frustrated individual who passes as an exacting expert on the basis of being able to produce infinite quantities of incomprehensible design criteria calculated with micrometric precision from vague assumptions which are based on debatable figures taken from inconclusive field surveys carried out by persons of doubtful reliability and questionable mentality for the avowed purpose of confounding a hopelessly overworked and underpaid group of wizards known all too frequently as plant managers."

Left to right: L. M. Lamkins of Manowa, Wis., Charles Clyborn of Warren, O., and J. F. Searl of Newton, Ia.

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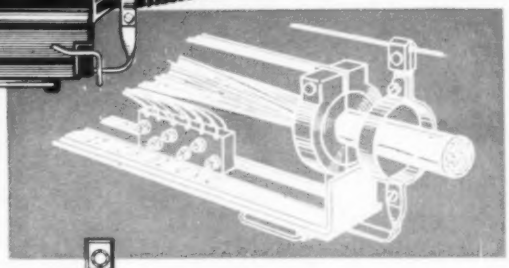

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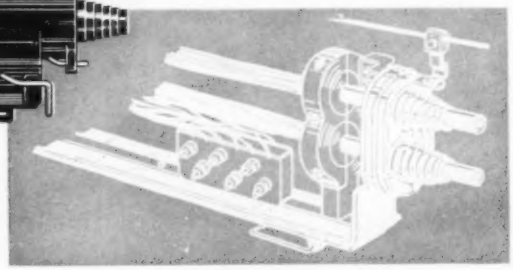

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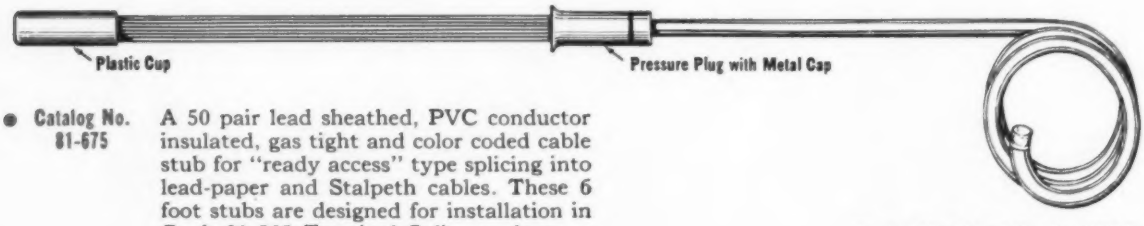

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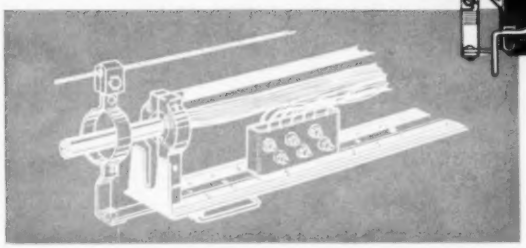

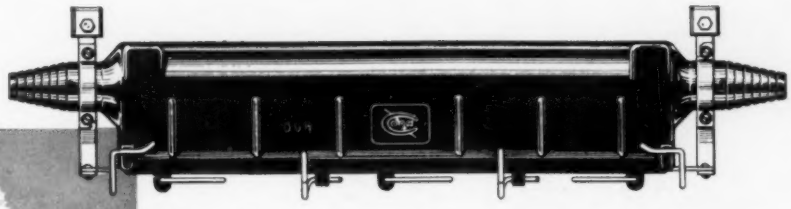

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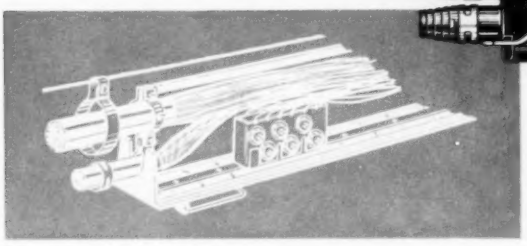

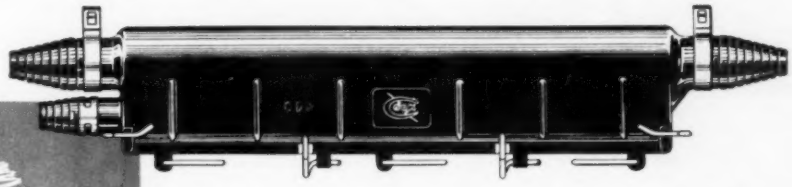

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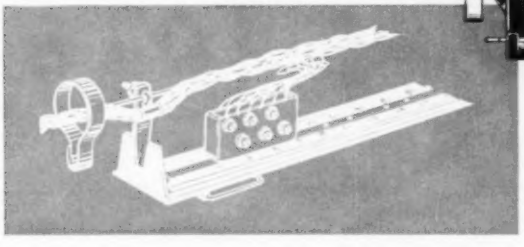

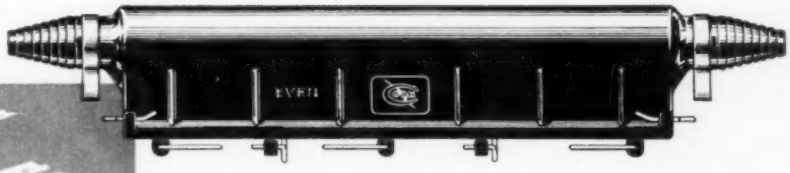

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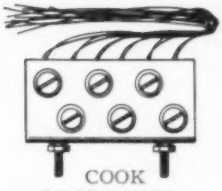

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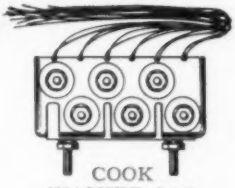

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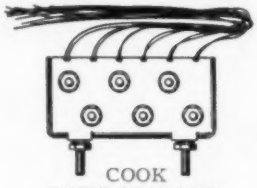

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Communications Network Planning

By B. H. PRYOR*

(An Engineering Conference Address)

I WOULD LIKE to set forth a few thoughts, some facts, and perhaps considerable opinion on the planning of communications networks. Before getting into the subject, I think it well to digress somewhat and try to determine just what our communications responsibilities are today and will be in the future.

If it were to be said that the impact of change on the communications business in the last few years has been rather startling, I am sure there would be very few among us who would not agree. This "change" has been more than technological, because it has had a very profound effect on our entire business attitude.

Field Much Broader

Being in the business of competing for the consumer dollar has probably left no doubt in our minds as to why our planning must tend to be customer oriented. This, coupled with the fact that we have also recently put considerable emphasis on the point that communications is a word with a rather broad meaning, charges our companies as communications common carriers to provide for the customer that which he desires or needs for his communications purposes.

Technological advances in electronics and the data fields are, today, promoting change in the entire pattern of customer communications. Rather than thinking in terms of telephones, it is mandatory that we broaden our thoughts to include all forms of communications. You might define our responsibility as the providing of means to permit the exchange of information between any two or more points in a network.

In the area which, today, is spoken of as the "continent-wide" network and which includes the United States and portions of Canada, facilities exist for service to in excess of 71 million telephones. Of these 71 million, some 50 million are identified with a unique number by which one may be distinguished from any other. To perform the interconnection job necessary, some 20,000 offices are linked into a common network by wire, cable, and radio.

Greater Future Challenges

Through changes covering a span of over half a century, a transition has been effected from manual type telephone operation to customer controlled Direct Distance Dialing service as we know it today. This advance is most impressive, but the indications are that the greatest challenges from a communications standpoint still lie in the future. Take for example the communications satellite, recently placed in orbit by Project ECHO, and electronic switching; surely the potentials of these two projects alone will have a momentous impact on our future communications network.

Among the things we must gird ourselves to do as an industry is to provide a completely integrated switching network which will handle all forms of communications. Today, we may still have justification for distinguishing between exchange and toll networks, although I believe we will have to come to think in terms of this one integrated network. Toll is distinguished by certain switching or transmission standards today, although the time does not appear far removed when this distinction may be justified by tradition only. Due to special circuit band width requirements, it is conceivable that a second or even a third network may be necessary, but nevertheless, we will soon be faced with the responsibility of handling "machine talk" in much the same fashion that "people talk" is handled today. Who is it that will deny that "machine talk," or data, if you like, may be the major part of our future communications business?

Need for Higher Quality

The only service we provide is through the establishment of point-to-point or multiple connections which provide a media for the passage of information. In other words, we switch networks and provide for transmission of some form of intelligibility. I doubt that the customer cares how we do switching as long as it is convenient to use and is accurate. To be convenient for "machine" usage, network establishment must be automatic to the extent feasible. I do not think there is any doubt that the customer will continue to demand, and must receive, what to him appears to be adequacy of transmission intelligibility. Today, this adequacy is more or less judged by voice quality, however, with data, other criteria such as bit speed and error rate will become paramount.

High quality transmission networks can go a long way in obviating the necessity of "machine" redundancy in error detection and correction features. I think it is important that we bear quality in mind when speaking of an automatic network, especially when considering "machine" originated networks. A company-trained employe, at one time, was in the position of network control, in that if wrong points were reached or the transmission intelligibility was impaired, the connection could be re-established with some measure of satisfaction, however, with the customer in control we are not afforded this opportunity.

*Mr. Pryor is Assistant Vice President-Engineering of General Telephone Co. of California, Santa Monica, Cal.

Economics Vital

Switching objectives in automatic networks, as now defined, come closer to being met today than the transmission objectives, primarily because switching tends to be somewhat less complex than the transmission problem in the "continent-wide" communications network. Generally speaking, I would say the same holds true for the small network.

Various publications have very admirably spelled out the switching and transmission objectives to be used in operator toll dialing and for Direct Distance Dialing and they need no further coverage at this time. By the same token, network parameters for placing the various forms of data on the message network will be established from time to time as such information can be determined. Regarding objectives, suffice it to say, that they are attainable today only by virtue of economies realized by technological advances made in the art of communications in the past.

As is true with many things we need or desire, including communications networks, a question in economics arises. Quality in these networks costs money, and with the number of network alternatives available today, very careful studies in economic selection are in order in the planning of a new network or in the use or reuse of an existing network.

Independents Important

It is in this area of network planning that I would like to dwell and set forth some facts and opinions which I feel especially apply to the Independent telephone industry. As contrasted with the Bell System, we are pretty much in the "end link," or, at least, what you might call the short network end of the communications business. Notwithstanding this situation, these "end links" or short networks are just as vital as is any portion of any network of which they may become a part.

Left to right: Dean C. Omans of Minneapolis, Minn.; Reuben Draheim of Medford, Wis.; Glenn E. Voyles of Cleveland, O.; John E. Winchester of Whittier, Cal.; and W. E. Billington of San Antonio, Tex.

The three fundamental or base media used for communications networks are open wire, cable, and radio. Wire and cable need distinguishment because the planning and use of each can vary considerably. Coaxial cable could be included although its use, principally, lies in the long-haul networks where generally the Independent telephone companies are not involved. Of course, coaxial cable may be used in connection with the provision of broad-band facilities such as closed-circuit or other television systems. Each of the three aforementioned media have different potentials with significantly different price tags for various applications. Of particular economic importance is the availability of electronic gear and the tendency for technological changes to reduce or at least delay increases in the price of this equipment.

Past Achievements

The use of wire or cable can be enhanced by improvements in signaling range, transmission range, or circuit capacity. An early industry example was compositing for a phantom on wire or quadded-cable to obtain an extra circuit for each two pairs available. Low current signaling techniques generally used with composite equipment also had the effect of extending signaling ranges. Applications of voice repeaters made it possible to achieve transmission loss objectives by repeater adjustments rather than by design of circuit length or copper cross section. This same adjustment was also applicable for signaling where voice frequency methods were employed.

The development of carrier techniques probably contributed more than any other single item in introducing economies leading to the specification of today's network objectives. Carrier equipment has the characteristics of permitting circuit capacity of the base media to be extended manyfold and providing transmission and signaling levels adjustable to objective standards. As contrasted with wire or cable, where significant cost reductions due to development are not likely to occur, carrier equipment, being in the electronic "family," will no doubt have future improvements so as to materially affect operational economies.

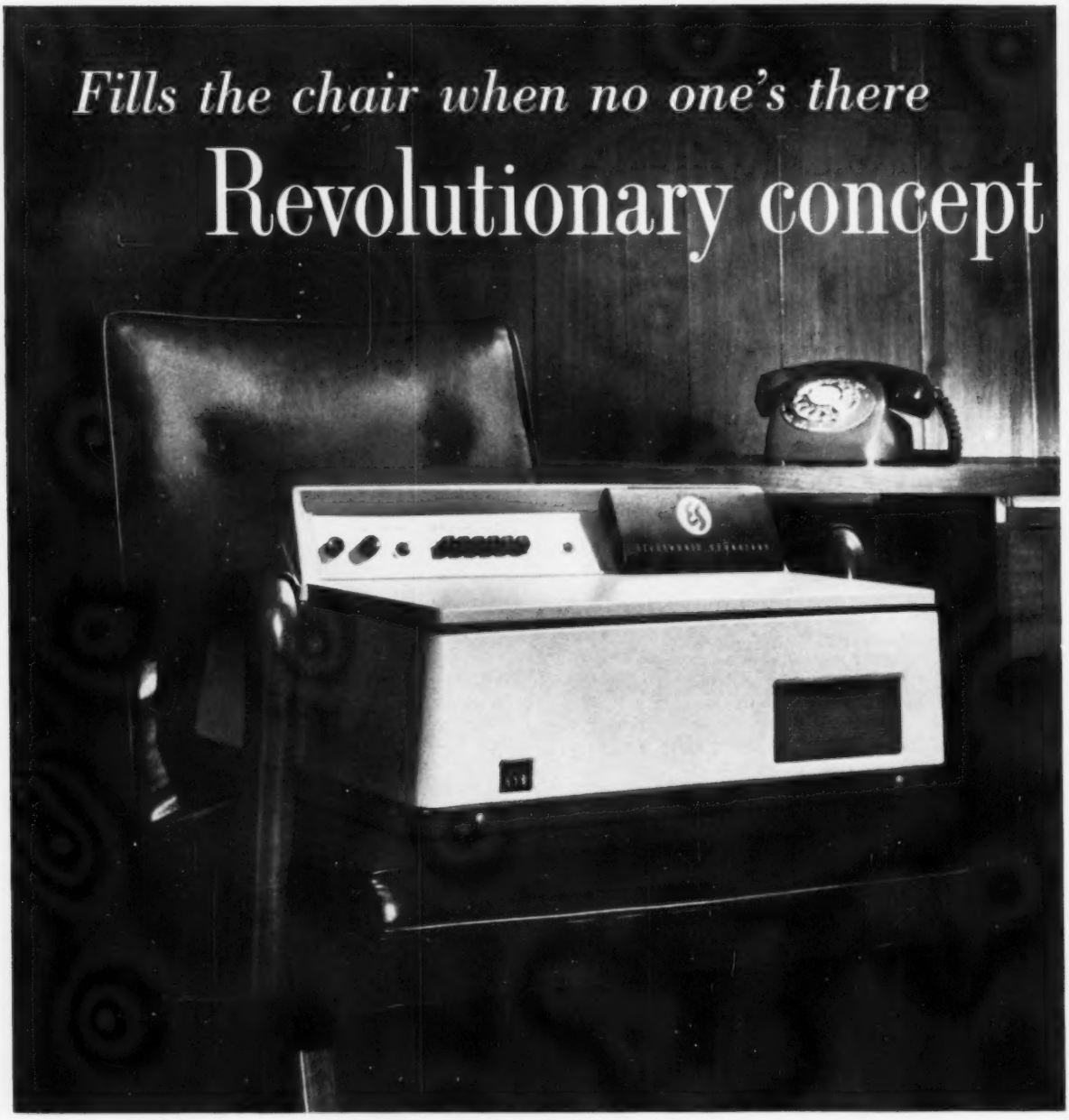
Carrier equipment generally falls

(Continued on page 82)

Left to right: Mrs. Cam Lanier Jr. of West Point, Ga.; Mrs. J. P. Gleaton of Tifton, Ga.; Mrs. Art Barnes of Atlanta, Ga., and Mr. Barnes, Mrs. H. A. Bishop Jr. of Starke, Fla., and Mr. Bishop.

Fills the chair when no one's there

Revolutionary concept



New line of ELECTRONIC SECRETARY telephone answering sets

LP(Long Play) model

The de luxe model that "does everything." Answers the phone automatically with message prerecorded by customer—(easily "erased" and changed)—records incoming messages, plays them back when customer returns. Takes any number of incoming messages up to 2-hour capacity. For service companies and individuals, stores, offices, plants and specialized uses in many other types of business.

SP (Short Play) model

This performs the same answering function as the LP model but has a more limited capacity. Answers the phone, gives message to caller, records up to twelve 13-second incoming messages. Compact, about typewriter size. Specially designed for the small service outfit or business. Low monthly rental greatly broadens the market.

AO (Answer Only) model

Answers phone with prerecorded announcement, but does not record incoming calls. Has microphone and tape recorder. Used by all sorts of organizations to deliver informative announcements up to 3 minutes. Theatres tell what's playing. Fuel suppliers and others leave numbers to call for emergency service at night. Advertisers sponsor weather reports, stock closings. Churches give inspirational messages.

# of telephone service now made available to meet every customer's needs

Traditionally, telephone service has been based on this simple proposition: when the phone rings, someone must be there to answer it. Then came a major breakthrough—telephone answering when no one is there—with fully automatic ELECTRONIC SECRETARY® phone answering sets.

And now, for the first time, a complete line of these remarkable devices is available to help expand your profits into entirely new areas.

Virtually unlimited market

Today, ELECTRONC SECRETARY sets are being produced in three basic models. No matter what kind of business or service organizations your customers run—no matter how large or small their companies may be—there is an ELECTRONIC SECRETARY set to provide just the kind of *fully automated answering they need.*

Just think how many of your customers are realtors, contractors, doctors, radio-TV repairmen—men in service businesses or professions who cannot afford to miss phone calls. Now you can offer them a practical device that answers the phone automatically—24 hours a day, 7 days a week—all for a modest monthly rental.

Think of all the larger business firms that can save time and money by having sales orders and reports phoned into an ELECTRONIC SECRETARY set. Finally, consider the many organizations who can benefit from "Answer Only" models—which make information announcements. They all add up to massive new markets for you.

National advertising now being readied

A powerful advertising program for the ELECTRONIC SECRETARY line means profitable business if you're ready for it. If you're interested in new revenue, we suggest you call or write either of the distributors listed below.

Electronic Secretary Industries, Inc., Subsidiary of GENERAL TELEPHONE & ELECTRONICS

GENERAL SYSTEM

distributed by

AUTOMATIC ELECTRIC SALES CORPORATION
400 North Wolf Road Northlake, Illinois

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427 West Randolph St., Chicago 6, Illinois

into two broad categories known as the long-haul variety and the short-haul variety. The terminal equipment of long-haul carrier tends toward the complex and elaborate having many built-in stabilization features. This sophistication is warranted for stabilization of long circuits and does not materially increase the cost-per-circuit mile. Short-haul carrier on the other hand is designed for less costly terminal equipment, embraces less elaborate circuitry and control, and requires the placement of carrier repeaters with relatively short spacings.

Radio Has Role

Radio equipment, in conjunction with its associated channelizing gear fits specific applications in the network. Radio equipment may be classified as light density or heavy density systems, depending on the quantity of circuits desired in the system. Radio, being in the same family of equipment as carrier, that is, electronic, can be expected to also be economically improved with future technological advances in the art.

Open wire, cable or radio in conjunction with voice repeaters or carrier equipment may be used on various base facilities and meet today's standards as the situation demands. Any one of the combination of base circuits may be the logical economic solution to a network problem. For instance, with open wire, voice repeaters can be used to meet transmission objectives, or there are offered a variety of open wire carrier systems which may be used to extend the capacity of the base wire facility. Consideration of terrain, which affects first cost and maintenance, and future route demand, should be seriously investigated before the placing of any new open wire. Where existing wire is to be used for carrier purposes, it may be necessary to rehabilitate to attain proper circuit electrical conditions.

Cable is the most extensive media used for networks today. Availability of electronic gear has greatly advanced the network capability of cable. Negative impedance voice repeaters have been very instrumental in enabling transmission standards to be maintained, while significantly permitting reduction of copper volume in the plant. Economic studies will show generally very definite justification for the placing of fine-gauge plant at today's prices.

Recent developments in short-haul type carrier have also resulted in apparatus which may economically compete with copper in the 5 to 10-mile trunk range and provide circuit quality of the highest order. Negative impedance repeaters and short-haul cable carrier systems may tend to complement one another in plant where the repeaters may be used to permit transmission objectives to be initially met, and then such repeaters replaced by the carrier systems in order to extend the capacity of the cable at a later date.

Due to the fact that carrier can extend the capacity of the cable, it has two uses in this respect; the first being to permit the initial installation of a cable with small pair quantity cross section, and, second, to extend the capacity of cable in place and hence defer cable installation by some period of time. These repeaters and carrier systems are flexible in that gain, within the design limits, can be varied as required for transmission purposes and in addition have the further advantage that the equipment may be readily relocated for use elsewhere if and when the need arises.

Left to right: Mr. and Mrs. Joe E. Trower of Mannford, Okla.; Harlan Goble of Covington, O.; Jack Najork of Glenview, Ill.; Mr. and Mrs. E. E. McKee of Lincoln, Neb.

Radio Plays Part

Radio equipment is making a very forceful entry into today's communication plant. There are a number of cases in which radio presents the most economical answer in network planning. These cases include:

(1) Areas of mountainous or difficult terrain where it is necessary to clear obstacles.
(2) Requirements for broad-band circuits.
(3) Temporary situations where it is not feasible to permanently locate other types of facilities.

Important items to consider in the planned use of radio are band width of the system and capacity of the channelizing equipment. The conservation of the frequency spectrum tends to be critical in some geographical areas and frequency diversity systems used in radio should be considered in this light.

Two Basic Alternatives

Again, bearing in mind that the objective of the network is to establish a connection to pass information from one point to another, there are two basic alternatives in making the connection. The first is directly from point

(Continued on page 139)

Left to right: A. C. Herbert of Harrisburg, Pa.; Mrs. Howard Fine of Rison, Ark.; Mr. Fine; J. D. Park of Newark, O., and Mrs. Park.

HEAR the break in the cable . . . locate the *exact* trouble spot *at once* with a SEITZ ELECTRONIC CABLE TESTER

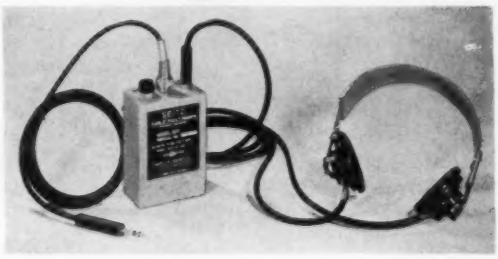
NO MORE DAMAGED INSULATION when you use the Seitz Electronic Cable Tester—invented by Dan Seitz, veteran of 50 years in the telephone industry. The Seitz Cable Tester, most modern improvement over previous methods of cable testing, detects the exact trouble spot in minutes—reducing long hours of searching, simplifies maintenance and repair, and *operates without damaging the insulation.*

YOU WORK FROM THE GROUND with the Seitz Electronic Cable Tester. This great advance in cable maintenance equipment *identifies pairs . . . locates opens, shorts, crosses* in rural and urban distribution wire, in parallel line wire . . . right from the ground. You *hear* where the trouble is—*never cut the cable.* The Seitz Cable Tester also locates power line interference with telephone circuits.

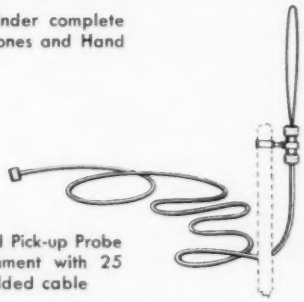
OPERATES ON STANDARD FLASHLIGHT BATTERIES . . . Transistorized and extremely sensitive, the Seitz Cable Tester operates many months on a standard 10c flashlight battery using any standard tone (bug). It does not require a special tone.

FAST . . . EFFICIENT . . . ECONOMICAL . . . The Seitz Electronic Cable Tester is simple and easy to operate. Light and compact, it fits in your hand, hooks on your belt, or slips into your pocket easily. So low in cost no telephone maintenance crew can afford to be without one.

MANY MORE PROVEN USES and complete operating instructions are included with the Seitz Electronic Cable Tester. The many, many more uses for the Cable Tester have all actually been proven in the field. You will find the Cable Tester enables you to complete jobs more quickly than you ever thought possible—and at far less cost.



A. Fault Finder complete with Earphones and Hand Probe



B. Overhead Pick-up Probe Pole Attachment with 25 feet of shielded cable

Chester Morton
ELECTRONICS
A DIVISION OF PROGRESS MANUFACTURING COMPANY, INC.

CHESTER MORTON Electronics Corporation
10th Street and Morton Avenue, Chester, Pa.

Please send ☐ Seitz Electronic Cable Testers @ $49.50 ea.
☐ Tone (Bugs) in Matching Case (Not Illus.) @ $14.95 ea.
☐ Overhead Pick-up Probe Pole Attachments @ $9.95 ea.

*Name*_____ *Title*_____

*Company*_____

*Address*_____

*City*_____ *Zone*_____ *State*_____

A View Of Things to Come

By WALTER A. STEVENS*

(An Engineering Conference Address)

YOUR ENGINEERING Committee asked me to speak today about "A View of Things to Come." I liked that subject very much. Not only is future planning my "line," but this broad subject allowed me to make my own choice of projects to discuss!

I've chosen two. First I want to tell you of the current planning to convert the switched teletypewriter exchange service (TWX) from manual to dial. Second, we have a colored motion picture of the Echo satellite communication project to show you.

Now a little background on the TWX service. This service was begun 29 years ago next month to fill a need for a nationwide station-to-station record transmission service. It has been well received over the years, and has grown to where currently there are over 50,000 stations in service. In 1959 TWX revenues totaled 57 million dollars, and 31 million messages were handled.

The service continues to grow, over 4,000 stations being added last year and 2,100 in the first seven months of 1960.

TWX is a message service. At present, connections are set up manually. The teletypewriters on customers' premises are terminated on manual switchboards at 101 locations throughout the United States. Telegraphtype transmission channels are used—both dc and carrier superposed on voice frequency circuits. All connections are established by teletyping the called station number—first from the originating station to the outward TWX operator, next between the outward operator and the inward or through TWX operator, then to the called station.

Active plans are now underway to convert this message service to dial. Dial operation will make the service faster, more pleasing to the customers, and will give the flexibility needed for other new service features which may be appropriate in the future.

As now planned, this service will be converted with a flash cut in about two years. The dial TWX stations will be connected to dial central offices and will be assigned 10-digit numbers (NPA + 7-digit central office code). These stations will be equipped with dial or pushbutton subsets, as required and will complete calls over the Direct Distance Dialing network.

TWX stations will not be equipped for talking. However, they will have a means of recognizing dial tone, busy line, ringing, etc.

Present manual stations will be converted to dial operation by the addition of a new Dataset. This subset will convert dc signals from the teletypewriter to tone signals for application to the line. It will also provide the means to receive supervisory tones and to dial into the serving central office as well as providing subset-to-subset circuit assurance and the necessary machine control functions. With the addition of this subset each TWX station will be able to originate and receive calls on a direct dialing basis.

TWX operating centers will be provided to handle assistance, collect, conference and similar calls. Today's 101 operating centers will be reduced to less than 20 centers to handle this work. These operating centers will be located throughout the country in key cities where there are regional center or sectional center switching offices. TWX stations will reach the operating center by dialing a special seven-digit service code. Inasmuch as TWX stations will not be equipped for talking, communication with TWX operators will be by teletypewriter machine.

Wherever practicable Bell operating companies plan to use crossbar offices to serve the dial TWX stations. However, where such equipment is not available step-by-step equipment may be used. All serving central offices must be equipped with ticketing equipment including automatic number identification and arranged to meet the requirements of DDD. Operator identification of the calling station may not be used because voice communication from the TWX station will not be provided.

Where TWX stations are located a considerable distance from a serving central office the loops can be provided in one of three ways:

(1) They may be connected to the distant office by means of a long loop—like a foreign exchange line. Suitable trunk equipment will be available.

(2) They may, if a number of stations are located near each other, be connected to a concentrator for trunking to the serving central office. Concentrator equipment will be available.

(3) They may be terminated in one central office for incoming calls and another central office for originating calls. This will care for the cases where the normal serving central office is arranged for incoming DDD, but does not have the necessary charging equipment to handle originating traffic. A divided access line circuit located in the normal serving office will allow originating calls to be made through another suitably equipped office, but all incoming calls will be completed through the normal serving office. It is a function of the divided access line circuit to indicate a busy to incoming calls if the TWX machine is in use on an originating call.

These are the plans for TWX service. The DDD subcommittee of the USITA Engineering Committee has been considering the technical aspects of this job jointly with us. And, as this

*Mr. Stevens is Systems Planning Engineer, American Telephone & Telegraph Co.

NEW GAT B-Beam Clip

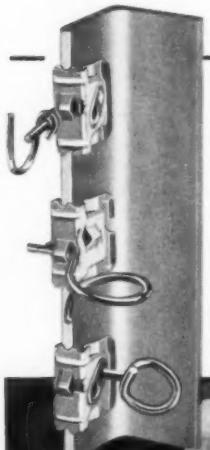
Recently announced by Erico Products, Inc. is the new "B" beam clip. Designed for and approved for telephone use to replace present universal Clamps and/or Support Brackets. This product has found additional markets in the electrical contracting field, sound and intercommunication industries.

For use with threaded or unthreaded Bridle Rings, Drive Rings and other low voltage Cable, Wire and Copper Thermostatic Tubing Supports.

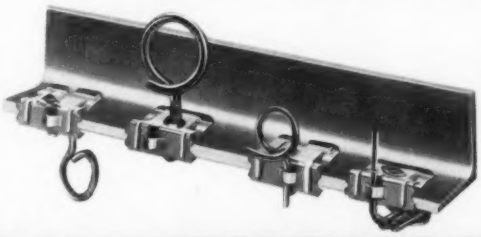
Recommended Maximum Load Limits:

Horizontal Pull 30 lbs. Vertical Pull 50 lbs.

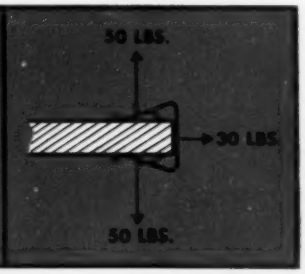
This clip will fit any flange from ⅛" thru ½" thickness regardless of flange taper.



INSTALLATION APPLICATIONS



HOW TO INSTALL



CADDY FASTENER Div. | **ERICO CADWELD PRODUCTS, INC.**
2070 EAST 61st PLACE • CLEVELAND 3, OHIO

morning's engineering committee report stated, they have prepared copies of a memorandum for you to take along. Also, the Bell operating companies will be working jointly with the Independent operating companies on the details of this job. It is a sizable job but worth doing and worth doing well.

Right now all but a few of the TWX stations are provided by the Bell System companies with about 3,500 stations being located in Independent company territory. Your representatives have expressed a desire to participate more fully in teletypewriter services. Dial TWX service will be new and modern and we believe there is a large future market for it, which can best be met by the telephone industry.

Now let's move on to Project Echo.

I am sure that all of you are familiar with the recent success of the communication satellite, Echo I and that most of you have watched it speed across the sky. Much has been written about Echo. And because Echo has been so brightly visible throughout the nation, it has probably done more than any other satellite to make our people space conscious.

Project Echo is sponsored by the National Aeronautics and Space Agency. The Bell Telephone Laboratories and Jet Propulsion Laboratories in Goldstone, Cal., have cooperated in testing some of the possibilities in communications via satellites. The movie will give us a good picture of these installations and the outstanding successful transmission between these points. In addition, the laboratories have cooperated with some overseas organizations in successful transmissions via Echo and recently, working jointly with the Naval Research Laboratory in Washington a highly successful picture transmission was made.

Why is the telephone industry so interested in satellites for communications uses? There are three very good reasons. First, we are always striving for good alternative means to provide world-wide communications because of the important service advantages obtained with dispersion.

Left to right: Mr. and Mrs. C. W. Chastain of Princeton, Mo.; J. M. Langston of Houghton Lake, Mich.; W. L. Jennings of Montrose, Mich.; Mrs. J. C. Ortman of Lawrenceville, Ill., and Mr. Ortman.

Next, we believe that, over the long-pull, circuits can be economically provided via satellites. Growth in all facets of our industry has been phenomenal during the last 20 years—especially overseas messages. As the growth continues we expect satellites to provide the means to care for this growth in present services.

Third, we look to satellites to provide, on an economical basis, new overseas services such as live intercontinental television which is impracticable today.

In this new field, there is a lot of technical work ahead for us. There are also some fundamental questions to be answered. For example: What about the ownership and operation of satellite systems? People have asked whether we will some day own satellites. Our answer is this:

We now share ownership of ocean cables with telecommunications organizations in other countries. We think we should similarly share ownership of any space communication system we may use. This puts full responsibility for the service right where it belongs—that is, with the organizations that provide the service. All parts of a communication system have to be designed and built and operated as units of the whole. Whether overseas links go via space or across the ocean floor, the purpose is always to connect any telephone in this country with any telephone in another country. To do this well, the telephone industry in this country and our partners overseas must take the same kind of responsibility for the links between countries that my company and yours take within the United States. This is the essential, whether the particular type of system employed is cable or satellite.

We probably would not go into the satellite-launching business. Today, we ask contractors to build our buildings, and in the future, we will probably ask others to launch our satellites. That way we would still risk our own money, design and operate a system in harmony with all the rest of the telephone network, and be fully responsible and accountable for the service we provide.

In the present stage of experiment and exploration, with space vehicles being launched for many different purposes, it is natural for the government to take the lead in putting up satellites. But when we come to providing communication service, we think we in the telephone industry should make sure we adequately fulfill the communications job that is ours to do.

To be more emphatic, we are certain that this will be in the best interest of

(Continued on page 143)

Left to right: I. D. Viets of Ozark, Ark.; W. L. Mollands of Atlanta, Ga.; Harold O. Davis of Los Gatos, Cal.; and J. G. Hagen of Atlanta.

NEW

BY UNITED STATES MOTORS CORPORATION

100 KW DIESEL "MICRO POWER"

A COMPLETELY NEW DIMENSION IN NO-BREAK UN-INTERRUPTED ELECTRIC POWER SUPPLY

United States Motors Corporation is keeping pace with the industry — growing daily. In days past, our Micro Power units ranged in size from 1½ KW to 20 KW capacity. Today, we are building Micro Power units in capacities up to the NEW 100 KW UNIT pictured above. Tomorrow — we will build them even larger to satisfy the increasing capacity requirements for dependable no-droop, no-drop standby power. Every Micro Power built today reflects more than 10 years of laboratory and field research-testing. What's more — several thousand operating units attest to its demand for a wide variety of applications.

SPECIALIZED SALES AND SERVICE CENTERS LOCATED THROUGHOUT THE UNITED STATES & FOREIGN COUNTRIES

For complete information — call or write

SPECIAL FEATURES

- ★ off the line initial start-up with automatic engine control.
- ★ load isolation from incoming supply at all times.
- ★ incoming 50 cycle frequency automatically converted to 60 cycle output frequency when desired.
- ★ ultimate for stabilizing incoming variations of voltage and frequency.

MICRO US POWER

UNITED STATES MOTORS CORPORATION 102 West Fifth Avenue • Oshkosh • Wisconsin

STROWGER DIAL EQUIPMENT SERVES EXCHANGES OF ALL SIZES

From small unattended exchanges to large multi-office networks, Strowger's faithful performance is proven year after year. Shown here are just a few of the many independent exchanges served by Strowger Automatic.

Whether you serve a village or a city, Strowger is your best bet for the future. The simple design of this dial equipment keeps adjustments and repairs to a minimum. Strowger is easy to finance. And if your area is growing, it's simple to expand the capacity of Strowger equipment.

Are you planning a dial conversion? If so, get in touch with us. We've helped hundreds of telephone companies—*of all sizes*—to solve their dial conversion problems. We'd like to do the same for you. Just write Automatic Electric Sales Corporation, Northlake, Illinois.

STROWGER DIAL EXCHANGES WITH LESS THAN 500 LINES

Chicora, Pennsylvania
Metamora, Illinois
Haskins-Tontogany, Ohio
Hamilton, Washington
Lena, Wisconsin
Wisner, Nebraska

STROWGER DIAL EXCHANGES WITH 500 TO 1,000 LINES

Tunkhannock, Pennsylvania
Johnsonburg, Pennsylvania
Knoxville, Illinois
Wakeeney, Kansas
Big Bear Lake, California
Breaux Bridge, Louisiana

STROWGER DIAL EXCHANGES WITH 1,000 TO 1,500 LINES

Hastings, Minnesota
Clintonville, Wisconsin
Tipp City, Ohio
Osceola, Iowa
Denison, Iowa
Caro, Michigan

STROWGER DIAL EXCHANGES WITH 1,500 TO 2,500 LINES

Lebanon, Oregon
Naples, Florida
Electra, Texas
Butler, Missouri
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STROWGER DIAL EXCHANGES WITH 2,500 TO 5,000 LINES

Lexington, North Carolina
Kalispell, Montana
Beatrice, Nebraska
Fulton, New York
Mount Airy, North Carolina
Troy, Ohio

STROWGER DIAL EXCHANGES WITH 5,000 TO 10,000 LINES

Newark, Ohio
Mankato, Minnesota
Irving, Texas
Butler, Pennsylvania
Johnson City, Tennessee
Middletown, New York

STROWGER DIAL EXCHANGES WITH OVER 10,000 LINES

Park Ridge, Illinois
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Lincoln, Nebraska
Jamestown, New York
High Point, North Carolina
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AUTOMATIC ELECTRIC

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GENERAL SYSTEM

Report of USITA Plant Committee

By M. S. BODINE, *Chairman*

THE PLANT Committee was requested to review and to comment and offer suggestions relating to the standards proposed by the Insulated Power Cable Engineers Association for Polyethylene Insulated Thermoplastic Jacketed Communication Cables.

The cooperation of the Plant Committee on this task was most gratifying. The comments and suggestions of the committee members were assembled and sent in to the Washington office where they were reviewed and edited to form a joint report of the USITA Engineering Committee and the USITA Plant Committee. It is hoped that the comments and suggestions will prove to be of aid to the Insulated Power Cable Engineers Association in their preparation of standards for polyethylene insulated thermoplastic jacketed communication cables.

Request for advice relative to the modification of certain powered construction equipment to make it applicable to other work loads was received from a member company. The considered opinion of the committee was forwarded through the (USITA) Washington office to this member company. It is hoped that the member company was aided by the advice. . . .

The committee is still endeavoring to develop a plan of production measurements, that will be simple enough in its inception that all who are interested in adopting it can do so with the least possible burden and can expand it as their particular operation may require.

Considerable attention and interest in new power machinery has been evidenced by members of the committee. Such items as powered derricks, winches, diggers, aerial ladders, aerial platforms and baskets have been considered. It has been found that some of these devices have materially reduced the work force required to perform certain construction functions. It is not the purpose of this committee to recommend that you go out and invest in this equipment but it is our purpose to call it to your attention with the view that certain of your neighbors may be in a position to advise you relative to savings that you might be able to effect. The aerial basket seems to be one item that offers considerable possibilities.

Once again let us call to your attention that "No Job Is So Urgent That It Cannot Be Done Safely." We will not try to tell you how to do every job safely, but we will stress that the "safeway" of doing the job is the least expensive in the long-run. Only by eternal diligence of the supervisory personnel will any safety program succeed. This means you. It must start with you and you must see that it is carried all the way down the line to the plant man performing the work.

Once again this committee wants to call to your attention the frontier of plant sales. The plant personnel still have the greatest opportunity to sell our services to the public. They have been doing that for years, but there is still a great undeveloped frontier in plant sales. Possibly the method of sales approach offers the most opportunity for development. It is a subject worth every effort that you can make in its behalf.

Your Plant Committee shall endeavor to help any member company with any construction problem that it may have. It is up to you to contact us regarding any of your problems. We earnestly request any suggestions on how we may better serve you, how we may improve our programs, what you would rather have discussed at our annual meetings and any other suggestions. . . .

Respectfully submitted,

PLANT COMMITTEE

M. S. Bodine, Chairman,
Jefferson City, Mo.

George B. Quatman,
Lima, Ohio

Frank S. Barnes, Jr.,
Rockhill, S. C.

C. C. Davis,
New York, N. Y.

Clayton E. Howden,
Rochester, N. Y.

What Price Freedom?

"These are the times that try men's souls. The summer soldier and the sunshine patriot will, in this crisis, shrink from the service of his country; but he that stands it now, deserves the love and thanks of man and woman.

"Tyranny, like hell, is not easily conquered; yet we have this consolation with us, that the harder the conflict, the more glorious the triumph. What we obtain too cheap, we esteem too lightly: 'tis dearness only that gives everything its value.

"Heaven knows how to put a proper price upon its goods; and it would be strange indeed, if so celestial an article as Freedom should not be highly rated."—THOMAS PAINE (1737-1809).

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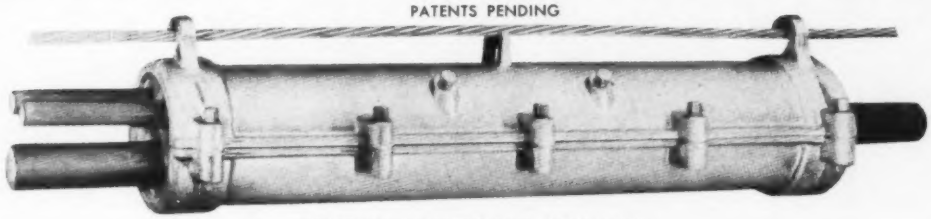
Can be used 100% on all new cable plant, PLASTIC, LEAD and ALUMINUM CABLES

PATENTS PENDING



CLOSED S-350-S (THREE-WAY) CABLE SLEEVE

MADE IN ALUMINUM OR PLASTIC

#S-175 Sleeve (1¾" I.D.)	$ 8.25	#175 Neoprene Grommets 6 to a box	$3.60
#S-350 Sleeve (3½" I.D.)	21.80	CS-3-4 Spanner Wrench	1.50
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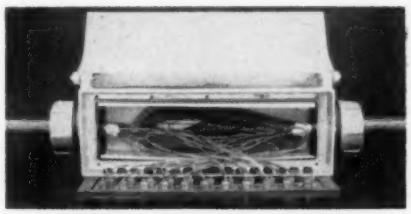
FOR CABLES 404 AND LESS

Buried or pole plant

No Splicing Required

$12.00 each

C-4 TERMINALS
For cables 101 Pr. and less



PATENTS

#2434102 #4318755 #2683304

C-6 Stake Ter.

CABLES 404 AND LESS

Buried plant

Splices may be made in Ter. when required

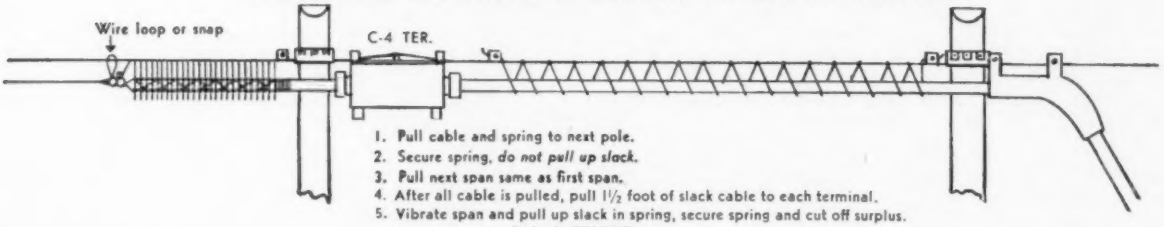
$15.00 each

Cable is pulled thru terminals, slack is left, wires are terminated without cutting and splicing.

C-4, 11 Pr. $20.00 ea. C-4, 16 Pr. $22.00 ea. C-4, 26 Pr. $25.00 ea.

Neoprene Grommets 6 to a box $3.60, branches $3.60

CHANNELL LASHING METHOD, WITHOUT LASHER



1. Pull cable and spring to next pole.
2. Secure spring, *do not pull up slack.*
3. Pull next span same as first span.
4. After all cable is pulled, pull 1½ foot of slack cable to each terminal.
5. Vibrate span and pull up slack in spring, secure spring and cut off surplus.

Patent 2767742

The springs are made in 21 inch lengths for 300 foot spans and can be cut to length on the job, 7 inches for 100 foot span.

ORDER NOW—SPRINGS $6.00 EACH for 300 FOOT SPAN, 2 TO A CARTON F.O.B. El Monte, Calif.

Transmission Objectives for Local Subscriber Loops

By ROBERT H. DAVIS*

(A Plant Conference Address)

WITH THE IMPROVED transmission made available by the use of the latest modern telephone sets, plant extension engineers can now reliably design local subscribers loops on a strictly resistance basis. The tedious transmission studies, made by many telephone companies, to determine the adequacy of transmission on local loop additions, has become an art of the past.

Resistance design is dependent on three basic fundamentals: (1) The allowable loop resistance limit to be controlled by the signaling limit of the central office equipment (in most cases 1200 ohms); (2) subscriber station instruments with at least the equivalent transmission qualities of the 500 type instrument must be installed on all loops exceeding approximately 700 ohms; (3) All cable loops over 18,000 feet must be loaded.

If we do not violate any of these three basic design fundamentals, we can be assured, our transmission limit will extend far beyond our signaling limit.

Resistance design is the preferred method to be used in a plant addition, because this method permits the plant engineer to make the most efficient use of existing cables, and utilizes the smaller gauge cables in areas where the greatest economy is to be realized. The reduced engineering time required is of major importance to all telephone companies. Adoption of the procedures used in resistance design will produce a plant with a high grade of average transmission efficiency, and will be acceptable to the public for the foreseeable future.

Special consideration must be given to PBX trunks where the loop resistance must include the PBX trunk equipment and the station loop. Here too, the battery feed relay may be located at the PBX, thus limiting any benefit to be received from a 500 type instrument. Paystation equipment also requires special consideration since it seldom functions properly on loops exceeding 900 ohms, unless equipped with a long line adapter circuit. It would be unusual to have a concentration of pay telephones in an area of such magnitude to affect the selection of the cable gauges.

In practice, the resistance method requires the engineer to layout both a *theoretical design* and a *proposed design* for the plant addition under consideration. The selection of cable gauges, loading point, and change out point, for the improved telephone sets, is taken from the theoretical design and incorporated into the proposed design. In laying out the theoretical design, all existing cable gauges are ignored. The cables selected to be used in the theoretical layout are the two smallest consecutive gauges which will not exceed the office signaling limit when shown in their ultimate length. The theoretical design must take into consideration all future extensions, additions, etc. which could affect this layout.

Where open wire is under consideration for an extension, it will require further engineering judgment. The economy of installing the open wire now, weighed against the cost of the selected gauges, and the future loop requirements in the area, will be the determining factors. However, if the theoretical layout specified a particular cable gauge, open wire could be utilized on the far end of any layout without troublesome results.

Let us consider a small cable extension installed several months ago in Bucyrus, O., and the functions required to plan this extension using the Resistance Design Method.

The make-up of the cable is as shown in *Fig. 1.*

It has been determined that a 50-pair extension at section D, 5,000 feet in length, and a 25-pair extension at section E, 1,200 feet in length, is required. To determine the size cable required for this addition, we must design a theoretical layout. As previously mentioned, the cable gauges selected for this layout will be the two smallest consecutive gauges which will not exceed the central office signaling limit of 1,200 ohms.

The theoretical design layout should look like the example shown in *Fig. 2.*

The ultimate length of this cable has been predetermined to be 30,243 feet; point U on the theoretical layout and the actual layout.

All of the engineering data required to obtain a theoretical resistance design should be obtained from design charts similar to the one shown in *Fig. 3.* These charts are an invaluable aid to the plant extension engineer.

These charts are scaled vertically, on each side, in loop resistance and horizontally across the bottom and top of the chart in kilofeet. To determine the two smallest cable gauges, we can successfully use in our theoretical design layout, locate the 1,200 ohm line on the vertical scale (central office signaling limit) and the 30 kilofeet line on the horizontal scale. These two lines intersect at a point in between the 24-gauge and 22-gauge cables. Since the cables with the greatest number of pairs are

*Mr. Davis is Equipment Engineer of Telephone Services, Inc., Lima, O.

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always nearest the central office, these cables, for economic reason, should be the smallest gauge. Therefore, Section A of our theoretical design specifies 24-gauge and Section B specifies 22 gauge.

To determine how many kilofeet of each gauge may be installed, draw a line parallel to the line representing the *largest* of the two gauges. This line begins at the point where the 30 kilofeet intersected with the 1,200-ohm central office signaling limit. The point where this parallel line meets the smaller of the two cable gauges is the separation point for the two. In *Fig. 3* this line (shown as dotted line) intersects the 24-gauge at approximately 10 kilofeet. Assuming the C.O. at 0 kilofeet, we can install approximately 10 kilofeet of 24-gauge and the balance of our ultimate length in 22-gauge. Thus, Section A of *Fig. 2* becomes 10,000 feet of 24 gauge and Section B specifies 20,243 feet of 22 gauge.

In the actual layout, *Fig. 1*, we have only 2,883 feet of 24 gauge. The theoretical design indicates we could install up to 10 kilofeet of this gauge cable. Since the permitted length of smaller gauge has not been exceeded; we can adopt the cable specified in the theoretical layout for the cable extension to be made. Therefore, Section D and E of *Fig. 1* would be 22 gauge.

At this point, the question usually arises, "if in this layout, we can install up to 10 kilofeet of 24 gauge, why shouldn't the extension be made with this smaller cable." The question is well founded, since some economy could be realized. However, this would prevent us from establishing the full 10 kilofeet of 24-gauge cable on the central office end; where the real economy is to be gained in the larger main cable and branch feeder cables. As cable changes and additions are required for future expansion, the engineer will be working toward this goal. The most economical plant addition will be achieved when the theoretical design is followed in all practical instances.

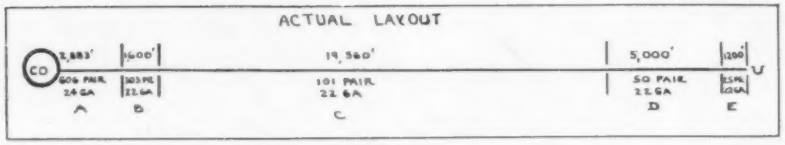


Fig. 1

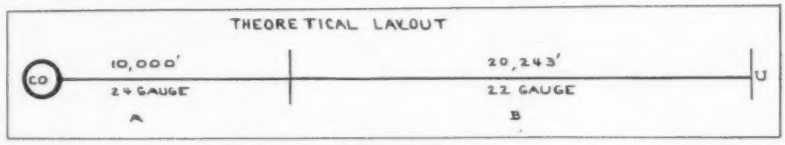


Fig. 2

The chart in *Fig. 3* makes available other information required to complete this cable addition. One of the basic fundamentals of resistance design requires all loops over 18,000 feet to be loaded. To determine how many loading points will be required, find the line on the horizontal scale representing the ultimate length of the cable. Follow this line up till it passes through the rectangles under loading data. The example in *Fig. 1*, using 30 kilofeet, will require four load coil locations. Transmission engineers have discussed many times the pros and cons of loading pure 19 gauge cable. At 1,000 cycles, unloaded 19 gauge will meet today's transmission design objectives. At frequencies near 2,000 cycles the attenuation is much greater. However, it is now, generally agreed, in the telephone industry to keep the loss as proportionate as possible over the various frequencies; this gauge cable too, should be loaded.

Finally, the resistance design chart will indicate to the plant extension engineer the locations requiring the improved telephone sets. The transmission design objective is an effective loop loss of —2.0 db for most telephone companies today. Using —2.0, as the design objective, we can easily determine the instrument change out point from *Fig. 3*. Locate —2.0 under the heading, effective loop loss unimproved set, and follow this line to the point where it intersects the cable under consideration. This point falls between 15 and 16 kilofeet. The installation of a 500 type telephone at this point will give an effective transmission improvement of —3.0 db.

All of the necessary information has been obtained to proceed with the proposed cable extension. In completing the actual layout, the engineer must take into consideration such other miscellaneous losses as bridged tap loss; drop wire loss, where the length exceeds 500 feet; PBX trunk equipment loss, etc. Excessive line noise in an area must also be given special consideration.

The desirable characteristics, presented by this method of design, will result in improved customer reactions; an economical plant that can be readily expanded with reduced engineering time in planning new cable installations or additions.

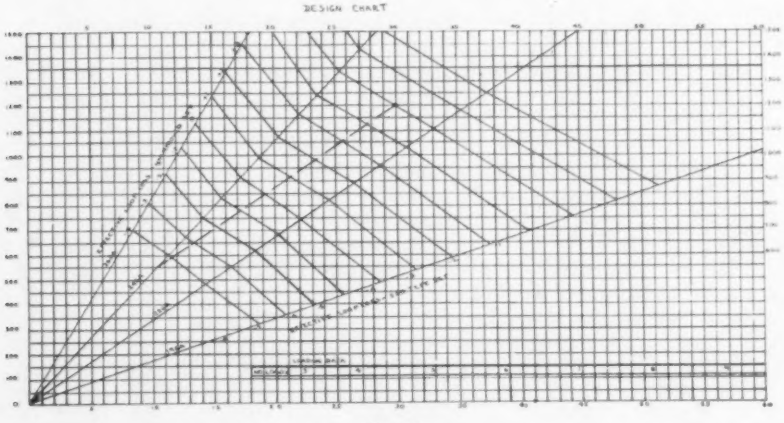


Fig. 3

Retirement Interest

Erwin D. Canham, past president of the Chamber of Commerce of the United States, urges that retired citizens plunge into politics—and says that they will find it active, rewarding, exciting, productive and engrossing work. He points out that retired people can serve the political parties of their choice by working at the precinct level, and that they do not have to become candidates for office. As he sees it, "We need more doorbell ringers."

American Mosaic

"America has been called a melting pot, but it seems better to call it a mosaic, for in it each nation, people or race which has come to its shores, has been privileged to keep its individuality, contributing at the same time its share to the unified pattern of a new nation." —KING BAUDOUIN I of Belgium.

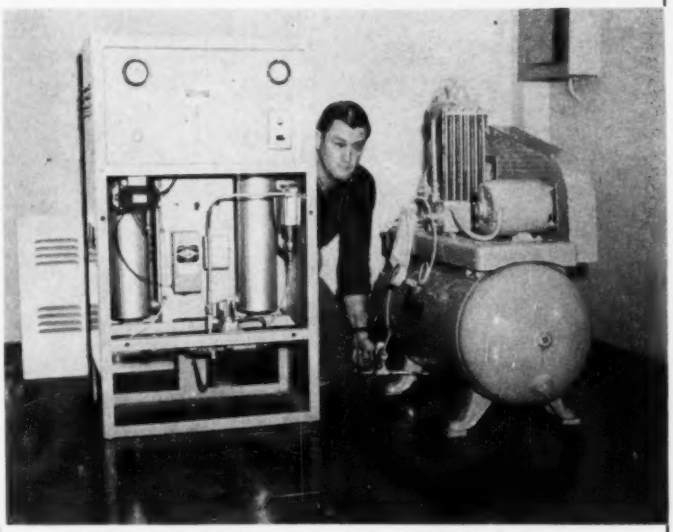
United Telephone of Pennsylvania reports . . .

"Not a single case of cable failure due to water trouble"

with S&G AIR COMPRESSOR DEHYDRATORS

and Accessories

S & G developed the dry air dehydrator used extensively by many operating telephone companies to protect telephone cables from moisture. According to J. Howard Federhoof, Plant Engineer for The United Telephone Company of Pennsylvania, the use of S & G equipment of this type has made it possible to locate breaks in the sheath, bad joints and bullet holes *before* they cause trouble — and that the work could be done during regular working hours, eliminating men working in bad weather, nights and overtime clearing cable failures.



This installation of the S & G Model A Dehydrator at the Chambersburg, Pa. District of The United Telephone Company of Pennsylvania is typical of the many hundreds of units now operating satisfactorily and economically in and out of the United States.

Users of S & G Dry Air Dehydrators (Desiccant Type) cite these advantages:

- Dries insulation faster and more efficiently than other types
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- Converts dollar savings into earnings
- Better service to customers
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The Application of Exchange Trunk Carrier

By CHARLES D. HANSELL*

(A Plant Conference Address)

ONE OF THE MOST challenging telephone industry problems of recent years has been the need for trunk carrier systems to prove-in economically at distances less than 15 miles.

It was reported[1] in 1956 that about 85 per cent of the Bell System's trunks (approximately 1.7 million) are less than 15 miles long. About 35 per cent were said to be less than 3 miles long. The percentage under 15 miles long is probably even higher for Independent companies. The development of suitable carrier systems, that would lower the cost of up to 50 per cent of our trunks, would indeed be significant.

In addition to first cost incentive, we have three additional reasons for wishing we could apply carrier to a higher percentage of our trunks.

Carrier has built-in net loss adjustment; at little or no additional cost we can provide whatever grade of service our subscribers demand, and easily readjust it when their opinion changes.

Carrier, compared to outside plant, is less vulnerable to physical damage, is not affected by highway construction, does not deteriorate as fast, costs much less to install and remove, and is nearly always reusable (often without having to move one end of it at all). This results in our philosophy that trunk route engineering should aim at increasing the ratio of investment-per-trunk in carrier and other terminal equipment, with respect to investment-per-trunk in outside plant. In other words, invest more of our money where the risks are smaller.

Carrier-derived trunks are superior in transmission. This is illustrated by recalling that carrier has the lowest Via Net Loss Factor[2]; and control of net loss variations is afforded by built-in automatic regulation (seldom provided in voice frequency systems because of extra cost and complexity).

Design Concepts

These general considerations evolved into the following system design objectives:

The system should compete with voice frequency systems in the 3-to-15-mile range of routine lengths.

It would be applied to existing trunk plant under existing plant conditions. Testing (pair selection), resplicing, balancing, or soldering of conductor splices, should not be required. The system should be usable on 30 to 50 per cent of a cable's pairs on such an "as-is" basis, providing about a 300 to 600 per cent increase in trunk capacity. Of course, even larger "fills" should be possible on new cables engineered and built specifically for this application.

System performance should meet present and future transmission objectives for message and dialed-up data service on all classes of trunks, except intertoll. Dialed-up Data-Phone service is now foreseen at speeds up to 1,600 bits per second.[3]

It would be desirable to design the system so that, on the typical facility (22 gauge 0.082 MF/MI cable), optimum repeater spacing would coincide with standard load spacing. In this way, pairs that were unsuitable for carrier could be reloaded ready-access style (in the repeater housings) and used again as voice frequency trunks. Not having to repeat the splicing operation would make it practical and economical to forego selection of carrier pairs on a test basis.

Crosstalk tests to select only suitable pairs would be prohibitively expensive and extremely impractical (testing of 50 pairs, for example, would require making 1,275 crosstalk-frequency runs in each repeater section, and again would at least double the splicing work). The usual half-section from the central office to the first load point would not be too short; a similar shortening of repeater sections adjacent to dial offices would help reduce the effects of central office noise (particularly impulse noise).

A major factor in cost reduction would be relaxation of design requirements for filters. One way to accomplish this is to increase the frequency separation between channels, and abandon frequency coordination with existing systems.

Lineup and maintenance procedures, and associated test gear, should be simple and quick. The go-no go method should be used. Plug-in modular construction for simplified trouble clearing by rapid replacement should be included.

Other cost reducing factors to be considered include transistors, miniaturization, automation, reduced power and space requirements, centralized repair service or plug-in sub-units small enough to justify throwing them away.

Design the channel units to reduce or eliminate the need for additional terminating equipment (repeat coils, signaling, and even trunk circuits).

(Continued on page 99)

[1]See all references at end of talk.

*Mr. Hansell is Transmission and Protection Methods Engineer, GT&E Service Corp.

When
it comes to
delivering supplies,
Leich
beats 'em all

FOR MORE DETAILS, SEE THE NEXT PAGE

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If this strikes you as an admirable policy, we're glad. If you'd like to try us and see if we are as good as we say we are, we will be tickled pink to have the chance.

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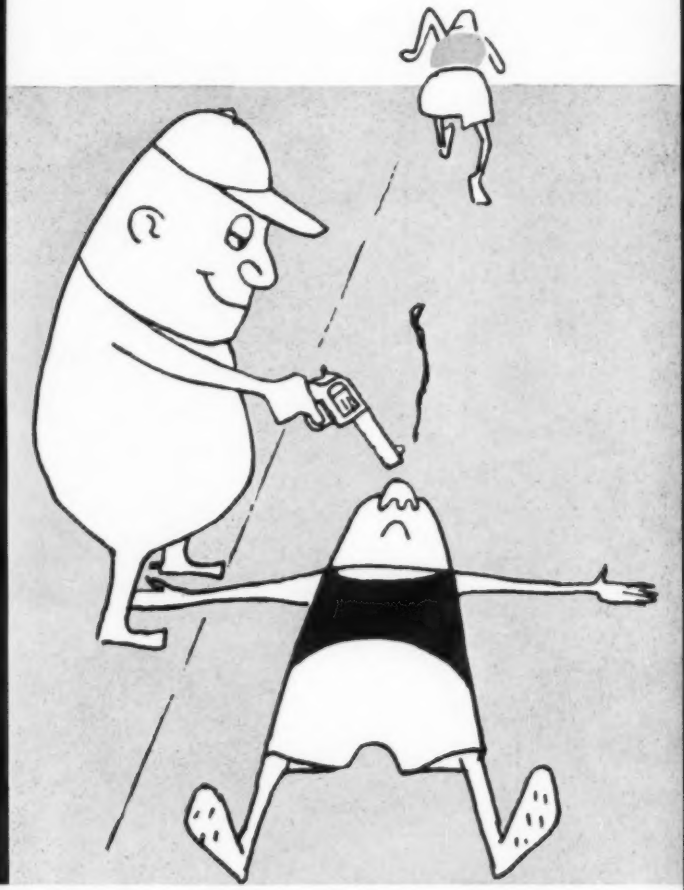

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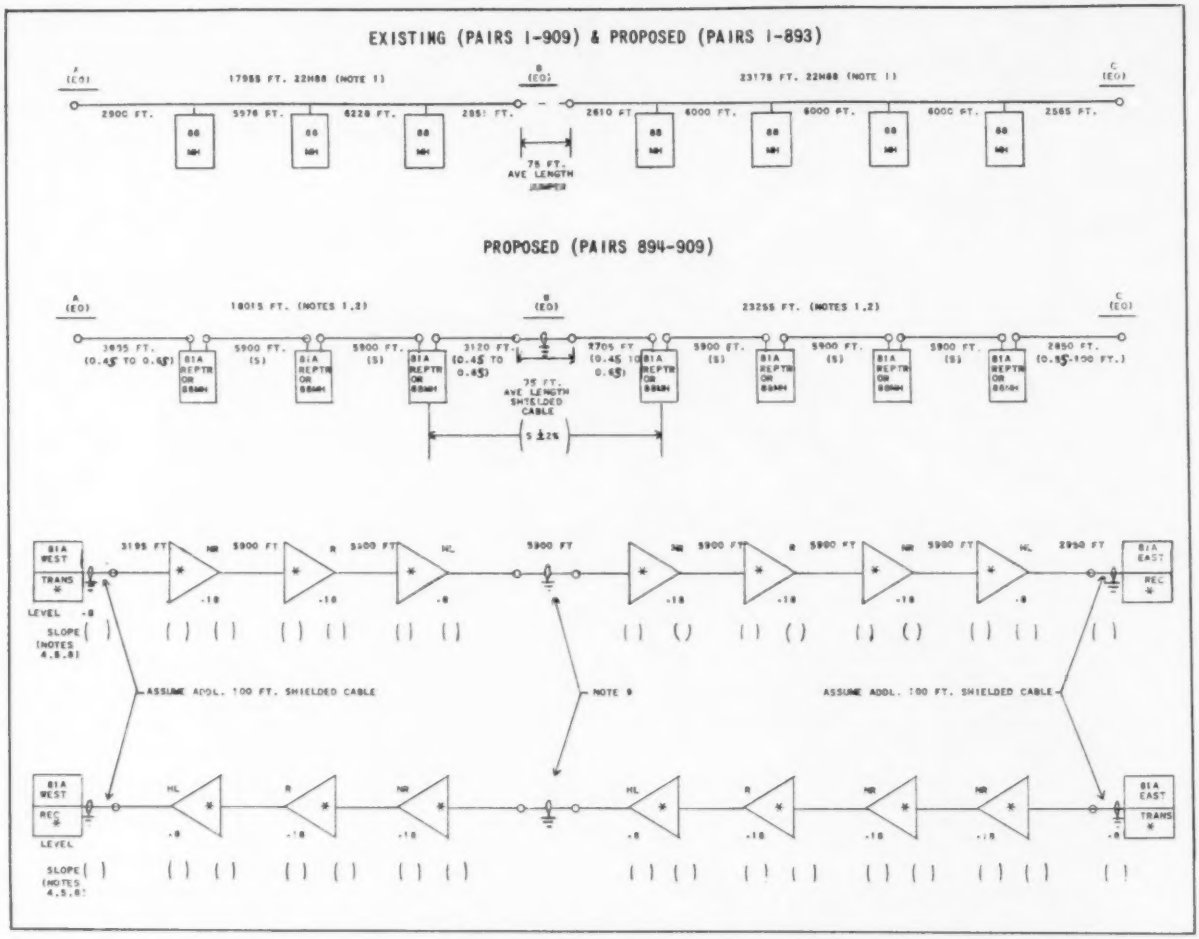
EXISTING (PAIRS 1-909) & PROPOSED (PAIRS 1-893)
PROPOSED (PAIRS 894-909)
75 FT. AVE LENGTH
35 FT. AVE LENGTH SHIELDED CABLE
ASSUME ADDL. 100 FT. SHIELDED CABLE
NOTE 9
ASSUME ADDL. 100 FT. SHIELDED CABLE
LEVEL
SLOPE (NOTES 4,5,6)

Fig. 1. Sample layout—exchange trunk carrier and loading systems.

NOTES:

(1) Cable is all 909-pair, 22 gauge, PILC, UG or buried. Max. temperature range assumed = +5°F to +105°F.

(2) Includes additional 10 feet into & 10 feet out of each repeater housing.

(3) Repeater layout assumes no obstacles—repeater housings at ideal locations.

(4) Transmitting levels shown at NR&HL repeaters assume +55°F cable temperature.

(5) In addition to levels shown, receiving level and slope (at the critical frequency, per manufacturer's information) should also be shown at each repeater & terminal. A calculated slope setting should also be shown, to show that layout is within the system's limits; actual setting normally determined by test during lineup-adjustable slope correction is provided.

(6) (S) = standard 6,000-foot load spacing ±2 per cent. Desired end section at end offices = min. 0.4, max. 0.6 section. Desired end section at toll offices = 0.5 section —75 to 200 feet. At intermediate offices on a through route, the sum of the two end sections plus the average length of MDF cross-connection should total the average section length ±2 per cent.

(7) Legend:

NR = non-regulating, normal level repeater; * = Calculated slope setting

O— = MDF

HL = non-regulating, high level repeater;

EO = Class 5 (end) office

R = regulating, normal level repeater;

A, B, C = office "names"

(8) Levels of individual channel carrier frequencies (DBM)

(9) HL repeaters, with adjacent half-section repeater spacing, would also be placed in the intermediate office (B), if toll connecting trunks were to be on this system.

Systems Now Available

Four concerns have now developed exchange trunk carrier systems. These are the Western Electric P1T, Kellogg K24, Panhandle X, and Lenkurt 81A.

The X is an FM-type system, and the others use amplitude modulation (AM). They are all based on the factors we have just discussed. Properly applied, any one of them should cost less, yet provide better service than voice frequency systems. Prices, details, and literature (on K24, X, and 81A) should be available from the respective manufacturer's representatives. In addition, a technical paper on the K24 system has been published in AIEE literature (see reference 4).

Engineering

The engineering job consists of four functions: plant extension, transmission and protection, equipment, and outside plant. The first two, together, match the trunk requirements with a growth plan that provides maximum overall economy within the transmission objectives—a balance between cost and quality of service that results in maximum profit through maximum subscriber acceptance. Detailed and specific requirements are usually furnished in the form of plant extension memorandums and transmission and protection letters. The equipment and outside plant functions involve preparation of actual "work orders," in accordance with the plan.

(Continued on page 102)

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Here's why it's so easy to sell Kellogg K-500s. Your subscribers are exposed to millions of dollars of advertising on the K-500 design each year. It's the telephone they know and want when they're thinking of color or extension phones . . . those extra instruments in a home that mean *extra* revenue for you!

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Following are some of the engineering considerations for the effective application of exchange trunk carrier:

Exchange trunk carrier should be kept completely out of cable sheaths containing one or more systems whose frequency band it overlaps, and vice versa. Frequency and level coordination had to be sacrificed to meet the cost objective. Whether made by the same or different manufacturers, mixing uncoordinated systems calls for

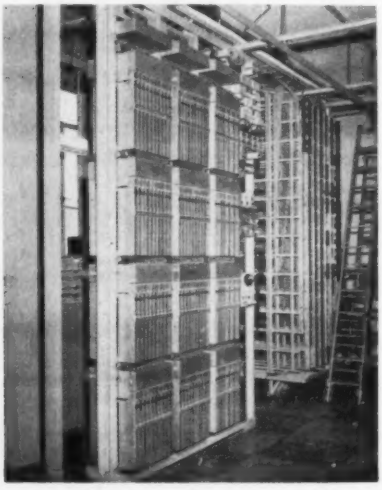


Fig. 2. 200-channel installation of "X" at Kennewick, Wash. (General Telephone Co. of the Northwest). Photo, courtesy of Panhandle Electric Sales, Inc.

very careful engineering consideration; if possible at all, it usually involves omitting some channels of one of the two types of systems or permanently—special lineup and maintenance instructions.

These systems are designed to function properly in cable that is in good working condition, and that is presently utilized in accordance with standard telephone industry practices. Existing trunk cables are probably loaded; and may have soldered conductor splices; were probably more-or-less random-spliced; and may have pair complements in their sheaths with en-route drop, open wire, or cable extensions.

The best choice of pair-numbers to be designated for deloading and terminating in repeater housings can be made if it is known how the cable was spliced originally. Various versions of random splicing were generally used in non-color-coded cables, and were often specified in color-coded trunk cables. Straight splicing is becoming standard practice for color-coded cables up to 10 miles long, when constructed under exchange-cable standards.

We suggest picking your carrier pair candidates so that the undisturbed pairs have a fair chance of acting as separators or spacers between carrier pairs.

Plant Extension's pair distribution diagram should designate consecutively-numbered pairs (such as 85-100, etc.) if random splicing was used (even if it was random only within pair units or binder groups or super-units[5]).

If the cable was straight-spliced, the pair numbering on the main frame should correspond to the theoretical pair numbers (as found on the cable manufacturer's cross-section diagram[5]), and pair selection procedure should be:

Make sure that the MDF pair count does correspond to the *main cable* color code count (not the "tip" cable); if desired, make an actual field check, and translate the MDF pair numbering to the color code or cross-section pair numbering.

The purpose of this is to determine the relative positions of the pairs in the main cable.

Decide upon the probable ultimate number of pairs to be terminated in repeater housings and tried for carrier.

This could be on the basis of anticipated ultimate carrier system capacity as limited by cable crosstalk, or on the basis of forecast requirements for growth over some desired engineering period (10, 15, or 20 years).

Select carrier pair candidates so that the remaining pairs serve as separators.

For example, if the ultimate calls for one-third of the pairs to be used or tried for carrier, select every third pair (color code count 100, 97, 94, etc.); for one-half, select every other pair (color code count 99, 97, 95, etc.; or 100, 98, 96, etc.).

The foregoing description is meant to suggest that if we put a little thought into pair designation, we have a chance of lowering the rejection rate, and ending up with a larger quantity of repeaters (in place of load coils) in each repeater housing.

New trunk cable construction, even if built initially to serve only voice frequency systems, should be engineered and built under carrier system requirements, because the odds are that carrier will be applied to it—sooner if not later. This involves considering such things as soldering conductor splices, bunch random splicing, and selection of cable having the best possible carrier frequency characteristics.

The development of Alpeth cables afforded considerable improvement in characteristics and in their uniformity. Another recent innovation netted still further improvement.[6]

When deloading pairs, any building-out cable or capacitors should also be removed from those pairs. When unsuitable or spare pairs are reloaded in the repeater housings, building-out should be included as and if required. It will be identical to the original building-out only if repeater locations are identical to the original load point locations. A good method is to attach the building-out capacitor to the load coil itself, to insure its being removed again when the carrier is applied.

It is necessary to remove all protection from the high frequency carrier pairs. Heat coils should be strapped out or replaced with solid metal. Protector blocks should be replaced with dummies. The reason is that protection apparatus does not operate simultaneously to ground from both sides of the line, resulting in very high voltage transients across the line. These transients can puncture a system's transistors. Conventional protection and transistors are just not compatible. The protection job is left to the non-carrier pairs, which should remain protected in the conventional manner.

If unsuitable or spare carrier pairs are to be reloaded, the designated pairs should be left terminated at the MDF. Shielded pair cable should be used to extend carrier pairs from the MDF to the carrier bay.

If unsuitable or spare carrier pairs are not to be or cannot be reloaded

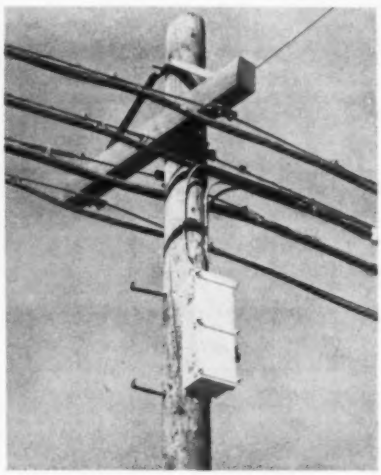
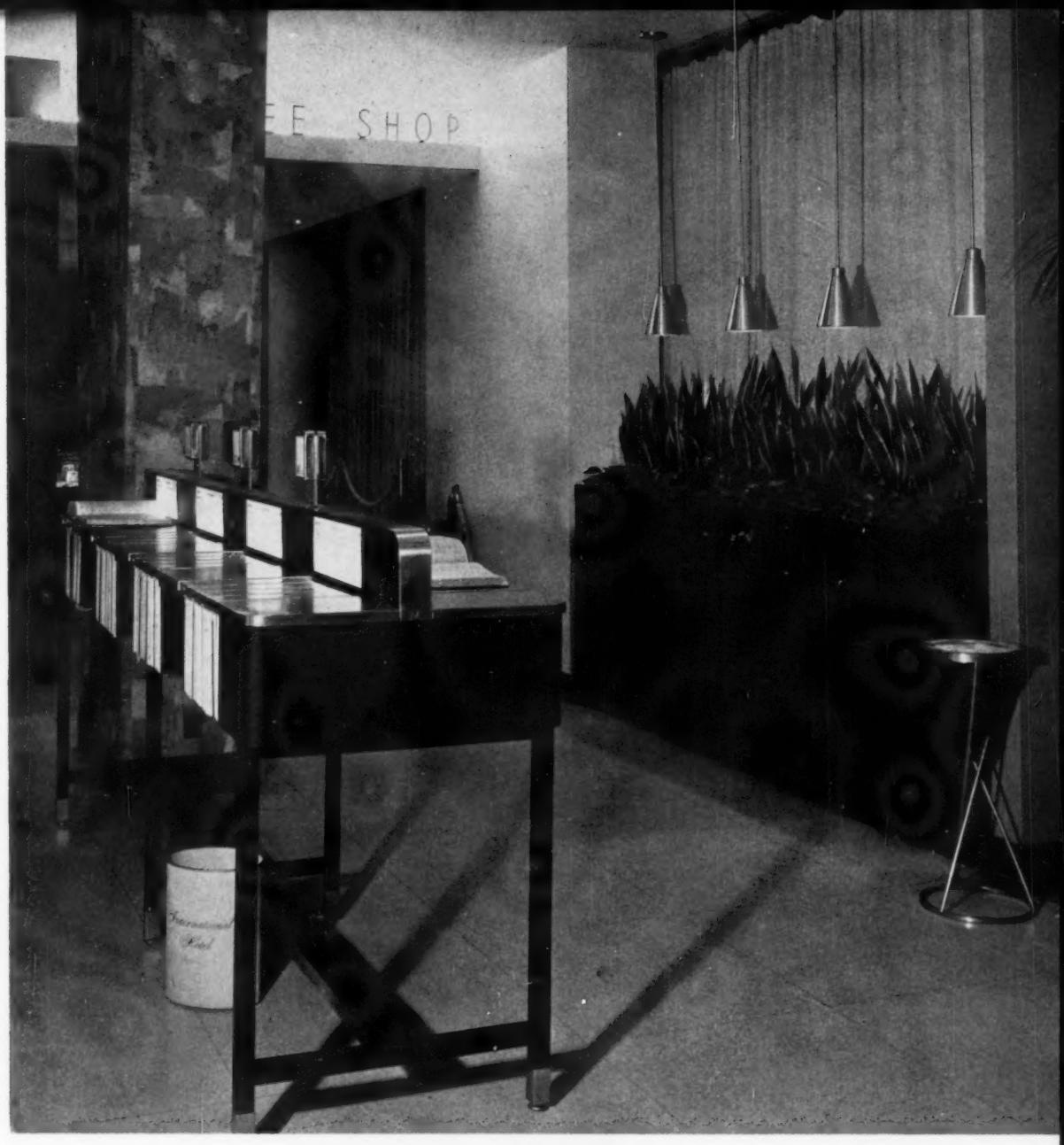


Fig. 3. "X" repeater housing installation at Kennewick, Wash. Photo, courtesy Panhandle Electric Sales, Inc.

and used for voice circuits, consideration should be given to cutting the designated pairs at the cable vault, to a branch PILC or Alpeth cable going to a cable terminal on the carrier bay (standard practice for N and BN type cable carrier layouts).

Unsoldered conductor splices are not expected to be a problem on those versions of exchange trunk carrier that



DIRECTORY TABLE

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provide repeater power by passing dc current from one terminal to the other (through all repeater sections). Those that feed repeater power independently from the ends may require special treatment of the "dry" center section. It might be necessary to arrange an artificial dc "sealing" current, or to open all cable splices in that section and solder the conductor splices.

A simple completion test, after the splicing work is completed is recommended. Instruct the splicer to strap-through the pairs in the repeater housings, and to measure the over-all loss of each pair at 20 KC. The measured loss is compared to the calculated value. Excessive loss indicates that there are load coils, building-out cable or capacitors, bridged tap, or just plain trouble, yet to be removed. The outside plant work order should specify this test, and allow time for it. It will save considerable time, expense, and frustration, in trying to locate "carrier" trouble.

We have mentioned that simplicity of system lineup and maintenance procedure is an economic factor. It saves time in itself. In addition, any local outside plant craft personnel can install or replace repeaters and load coils; and make repeater lineup, maintenance, and trouble isolation tests. Only a few hours' training is required.

Another advantage is that when manholes are involved, these personnel are generally familiar with recommended precautionary measures. The resulting reduction in travel time of centrally-located personnel will reduce both outage time and maintenance expense. The outside plant work order should include installation and lineup tests of the repeaters and load coils, as well as installation and splicing of repeater housings and cable stubs.

If necessary, perhaps a method could be worked out for adequate prealignment of repeaters on the bench by the central office man. But this would be less desirable than lineup under actual conditions. Actual level and slope at the repeater input will vary slightly from one cable pair to another, and uncompensated residuals could accumulate, causing unsatisfactory results.

Repeater spacing should be within the tolerances of one of the standard loading systems (B, D, H, or even M spacing). Since pairs loaded in repeater housings will be segregated from the existing loaded pairs, it is not absolutely necessary to put them at existing load points—if you can improve upon the accuracy of the existing spacing, by all means do it.

If the carrier system is designed for satisfactory operation with 6,000-foot (H) repeater spacing on 22 gauge 0.082 MF/MI cable, it should generally be satisfactory at 9,000-foot (M) spacing on 19 gauge "high capacity" cable, and at 12,000-foot spacing on 19 gauge 0.062 MF/MI (quadded) cable. But this depends on the highest line frequency of the system, and whether the cable conductor insulation is paper or polyethylene (this results in a considerable difference in loss and slope for the same cable gauge and capacity).

When repeater spacing can be longer (or must be shorter) than standard spacings, any of several solutions could be chosen. Unsuitable or spare pairs could be cut back into the existing loading (excessive splicing time), or merely left dead (also uneconomical).

Duplicate housings (additional cost) could be installed at load points, as well as at repeater points, and each pair strapped-through at whichever set of housings were not used. Or repeater spacing could be shortened from its possible maximum, to the next lower standard load spacing, and "unused" allowable loss and slope just considered extra margin against noise and impulse noise.

First cost could be the main consideration in choosing a solution, but subsequent time and expense to make full use of all pairs could make a small percentage of extra first cost well worthwhile.

Repeater sections adjacent to dial offices should be shortened so that the received carrier levels at each end of the section are about 10 db higher than allowed in regular repeater sections (if the system being used will accommodate it). Half-section termination of loading systems is standard practice, so the objective of matching repeater location with standard load spacings

Fig. 5. "81" repeater housing installation. Photo, courtesy of Lenkurt Electric Co., Inc.

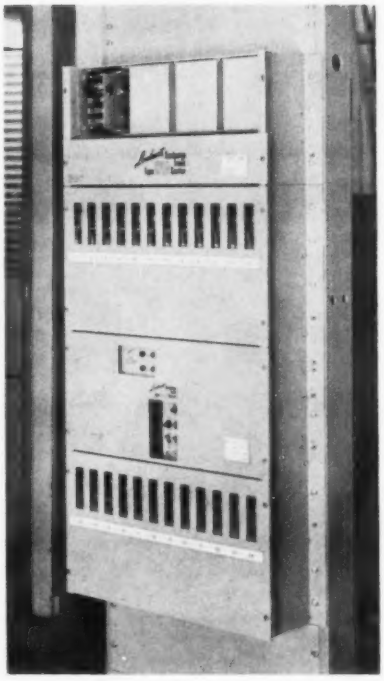

Fig. 4. "81A" terminal — 24-channel terminal shelf, and carrier and power supply shelf. Photo, courtesy of Lenkurt Electric Co., Inc.

would automatically provide the desirable effect.

It would even be desirable to provide up to 10 db higher than "normal" transmitting level in both directions, within a section adjacent to a dial office (again, if the system being used is so arranged). This would require the carrier terminal, and the adjacent repeater transmitting toward the terminal, to be so equipped.

If both features were available, repeater section receiving levels adjacent to a dial office would be up to 20 db higher than in outlying repeater sections. These are very important considerations in meeting the requirements of dialed-up TWX and Dataphone services.

The higher levels help overcome the effects of impulse noise. Impulse noise isn't noticeable in our regular message service. But since these new uses have been developed for our regular switching network, it has become one of several additional problems to be reckoned with in our every day work.

TWX, data, and similar service requirements are no longer to be shrugged off to an engineer on the sidelines for "special" engineering on separate and "special" facilities. Making more efficient use of our regular switching network through such additional services is one of our industry's biggest potential advantages over the extremely ac-

(Continued on page 145)

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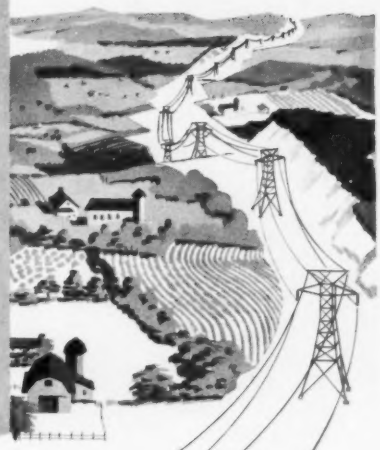

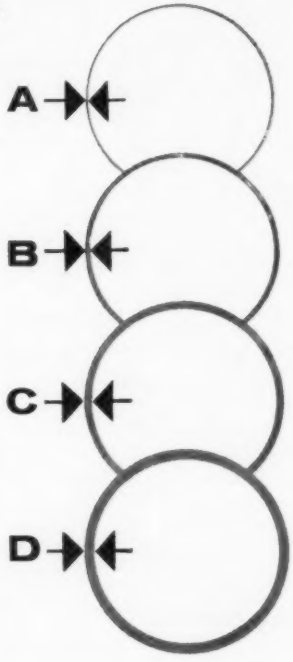

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The Economies of Line Concentrators

By ROBERT C. HUNT*

(A Plant Conference Address)

WHEN I WAS asked by a member of the USITA Plant Committee to prepare and present this paper on line concentrators I asked him what he thought my qualifications were and his answer was that since we had two of these units in service perhaps I could pass on to you our experiences concerning them. It is with this knowledge that I appear before you today. Our experience, while limited, may be of benefit to you and I will try to outline the situations and events that prompted our decision to buy and install these units.

In the last several years, telephone manufacturers have been offering for sale to the Independent industry devices known as line concentrators. These devices offer many advantages to the user provided they are used in the right way at the right place. This paper will be concerned mainly with the economics of such devices, giving examples of their correct use, examples where they should not be used, and will touch briefly on the mechanics of such devices.

Line concentrators, for those of you who are unfamiliar with these units, are relay devices, usually in the form of a large crossbar switch which permits the rapid switching of a subscriber line to a traffic talking trunk to the central office. Concentrators are used in pairs, one placed some distance from the central office where additional cable facilities are needed, and the other in the central office. These usually are called the "Subscriber Unit" and the "Central Office Unit," respectively. The two units are in effect mirror images of each other, each performing a simultaneous and identical switching operation. Line concentrators have come into being because of the need to increase the efficiency of outside telephone plant and because of the statistical fact that not all of the people use their telephones all at the same time.

Consider the following example: A 15-pair cable terminal at the fringe of a growing community is serving 10 one-party lines and five two-party lines, for a total of 20 subscribers. Additional houses are planned for the area. Before the advent of line concentrators the only alternatives available to the telephone company were to provide permanent additional cable, or to string urban or rural distribution cable back to where pairs were available, or to degrade the service by changing some of the lines already in service to four-party service.

This situation is not unique. In the growing America of today it is becoming the rule rather than the exception. Until the time of line concentrators, cable pairs had to be provided in some manner all of the way back to the central office. In the above example, let's assume that it is 2 miles to the office. Now the problem begins to assume some rather large proportions. Since the average residential line is in use something less than 5 per cent of the minutes in a day, a little figuring shows that we have a cable pair lying in the ground or hanging in the air ready to serve 95 per cent of the time, but actually doing nothing in the way of providing telephone service. If some way could be found to switch this pair around to various subscribers in the area when they desired service, much of this 95 per cent of idle time could be used by other subscribers. Line concentrators perform this switching job and are available in sizes as small as nine talking trunks and 19 lines to as large as 20 talking trunks and 100 lines.

Let's get back to our 15-pair cable terminal that was full and was serving 20 subscribers. Using one of the line concentrators that are available today, we can expand the capacity of this terminal in the following manner. Assuming we expect a substantial growth in the area, we will purchase and install a nine-trunk, 49-line unit. To operate this unit we need 11 pairs; nine pairs for talking trunks and two pairs for switching control. This leaves us four pairs in the terminal for direct service. How this terminal would appear after installation of a concentrator is as follows:

Pairs	Usage	Lines	Subs.
4	Two-party, direct	4	8
2	Control	—	—
9	Talking Trunks	49	63
15	Total Subs Served		71

Here we had a 15-pair terminal serving 20 subscribers and now it is capable of serving 71. This terminal is now serving 355 per cent of the subscribers that it did formerly and we were able to do it without the necessity of constructing pairs 2 miles back to the central office.

All of us here are exposed to the methods of American advertising. When a gasoline company offers a fuel that will boost gas mileage in your car 6 per cent it is shouted to the house tops. When a salesman for some type of office equipment can show you how to save 20 per cent on the cost of doing an accounting job, he shouts it to the house tops. Now when we have available to our industry a device that boosts efficiency of cable pairs more than 300

*Mr. Hunt is General Manager of the Blair (Neb.) Telephone Co.

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Despite satellites, the workhorse of systems communications will still be the same old cable pairs. But with alternate routing and VNL you'll regard them in a new light; and you'll take a more searching look at load coil spacings, net loss and return loss, while bias and sigma (old words with new meanings) will force you to correct trunks that don't meet minimum standards.

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**Available with plug-in units for either #22 or #24 gauge cable, or mixed 22 and 24 gauge. Other commonly used gauges available on special order.*

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per cent, it certainly behooves us to take a good look at this thing. It probably is the one single device in the telephone industry that increases efficiency of our outside urban plant more than any other that is available today.

When one considers that units are available in sizes to 100 lines that operate over 22 cable pairs we can see that efficiency gains in the order of 450 per cent are possible. Here is something too big to be dismissed as "just another gadget." A closer look, and a little figuring on the part of all telephone people is in order. This gain in cable pair efficiency is not without the expenditure of dollars, but when these units are correctly used the cost can be small compared to the service that the units can provide.

Left to right: L. F. Vakaty of St. Paul, Minn.; Andrew Pudlak of Glassport, Pa., and E. W. Bollmeier of St. Paul.

Situation No. 1

Located 1½ miles from the central office of my home town, Blair, Neb., is Dana College, a small, church-supported, liberal arts institution. This college has been there for 76 years and currently has an enrollment of about 300 students. When our buried cable plant was installed, back in 1926, this area was served by a 25-pair cable terminal. Since the college is outside of the city limits this terminal also serves 11 rural lines. For many years past, the terminal had sufficient capacity to provide the services desired in the area.

With the recent emphasis placed on education the college has begun to expand. This expansion has taken the form of new dormitories, classroom buildings, libraries and administration buildings. Any expansion also has to be accompanied by an increase in personnel. The area has gradually built up with many new homes and the area was recently incorporated in the city limits of Blair.

You can guess the results of this expansion on telephone service. While I'm not proud to admit it, we had to offer only four-party service to new homes and a five-pair aerial cable was temporarily back-strung seven-tenths of a mile to get some additional pairs. It appeared that a new 50-pair cable should be installed in the area, but to get it would require that we go clear back to the central office. Of the 1½ miles, eight-tenths is through an area traversed by gullies and ravines, which is totally unsuitable for housing. It is a rare situation, indeed, where an operating company would start out from the central office with only a 50-pair cable, and we had no thought of doing this. Our plans called for a 200-pair cable for the first six-tenths of a mile, a 100-pair for the next two-tenths, and a 50-pair for the remaining seven-tenths of a mile. The built-up area of the town is adequately cabled and while we planned larger cables we had no real need for these extra pairs through the built-up area.

Without boring you with volumes of figures concerning the cost of cable, ditching, and labor, suffice it to say that the project was estimated at $12,000 if only 50-pair cable was installed the entire distance.

At this time, we were also aware of the availability of line concentrators. Prices of these units were obtained, along with estimates of the installation costs. These costs are tabulated as follows:

12 trunk, 49 line concentrator	$4,829.00
Labor to install.....	500.00
Total cost	$5,329.00

This unit required 15 pairs to operate, 12 for talking trunks and three pairs for switching control. It provided us with 49 new pairs derived from 15 pairs for a net gain of 34 pairs. The original terminal can of 25 pairs would then provide service as follows:

10 pairs. . Direct service to rural lines.
15 pairs. . Concentrator usage—49 lines.

This application looked attractive to us for several reasons. First, the original cost was less than half of the projected cable project. Second, it could be purchased and installed in less than a month, which would free our construction crews for other work. Third, the unit was recoverable where buried cable was not. Fourth, it would supply service equally as good as direct cable pairs on a permanent basis or a temporary basis.

This last point should not be overlooked. The concentrator gives us a chance to take a better look at the growth in the area. Today, we might say that a 50-pair cable is entirely sufficient for the area and, yet, two or three years hence we might wish that we had originally installed a 100 or 200-pair cable.

It is entirely possible that the concentrator will become a permanent part of plant and, yet, depending on the

Left to right: John B. Noggle of Charlottesville, Va.; Mrs. Noggle, and E. J. Murphy of Elmhurst, Ill.

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Pumps fast—over 8000 GPH. You save on manhours and cut down water damage through fast action.

Pumps silently . . . a good public relations feature. Special "silent" muffler keeps noise down—keeps peace in the neighborhood. Muffler protected by expanded metal guard . . . IT'S SAFE TO BE AROUND!

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The Hale "Torrent" manhole pump is available from stock with 4-cycle engine — for use with either gasoline or LP gas. All gasoline units are equipped with exhaust valve rotator. ALL units are equipped with stellite exhaust valve and seat, plus recoil starter.

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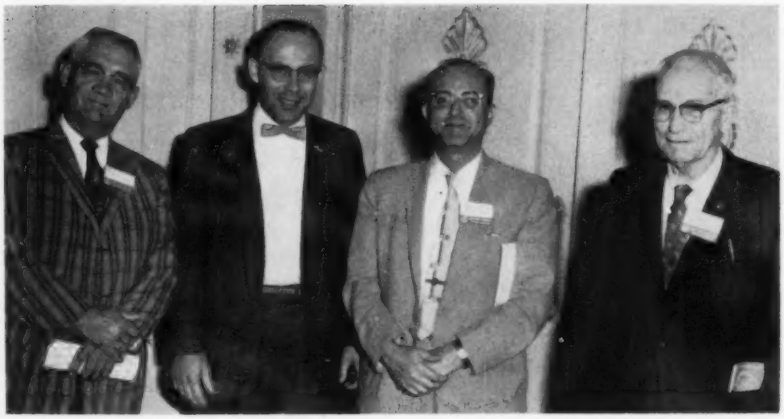
growth in the area, it may allow us to make a better estimate of our eventual needs later on. Guessing where, when, and how a town will grow is one of the problems that beset telephone people. A device that can forstall the exact decisions that must be made when an area is building up until the building has gotten well underway is worthy of consideration.

The high recoverability factor is something that is also worthy of note. The subscriber unit can be recovered when and if additional cable is brought into the area. Since the central office end is installed, the subscriber-end unit could be removed and reinstalled at another location in about 40 man hours. The only office change would be the moving of 15 jumpers on the main frame. Thus, sometime in the future, we could within the space of two days and for about $150 labor provide 34 additional pairs at any place in our cable plant where 15 pairs are now available.

Perhaps a word should be said about traffic considerations. As I mentioned earlier, concentrators are available in various numbers of lines and trunks, those having a larger number of trunks obviously will handle a greater amount of traffic. Tables are available from the manufacturers which show the unit-calls that each size unit will handle. It should be noted at this point that the concentrator does not make connections between lines within the unit itself, but rather connects any line desiring service whether originating or terminating, to a trunk to the central office. Calls which both originate and terminate on different lines in the same concentrator, therefore, use two trunks for the duration of the call. The actual connection between lines is still made by the central office switchboard in the usual manner. A true reverting call to another party on the same concentrator line uses only one trunk, but it is held for the duration of the reverting call. Manufacturing personnel are well acquainted with the operation of their equipment and should be consulted concerning these technical points.



Left to right: W. C. Whitecotton of Elkhart, Kan.; C. G. Smith of Hershey, Pa.; Dr. S. D. Melnicove of Pine Grove, Pa., and Burton Wilcox of Hazen, N. D.

Since ours is a small company, we do not possess the metering equipment to make studies as to the exact usage of each individual line that was placed in the concentrator, and I'll have to admit that we made "guestimates" based upon interviews with the customers and from our own knowledge of the calling habits of the area. Knowing that the college was a unit unto itself, led to the belief that reverting calling back into the area would be heavy. The unit that was purchased has 12 talking trunks and at present has 31 lines in use. Metering equipment on the concentrator has shown that, since it was installed in June of 1959, we have had only three ALL TRUNK BUSY conditions during this time. Obviously, we have too many trunks for the 31 lines in use, but it must be remembered that as many as 49 lines could be connected.

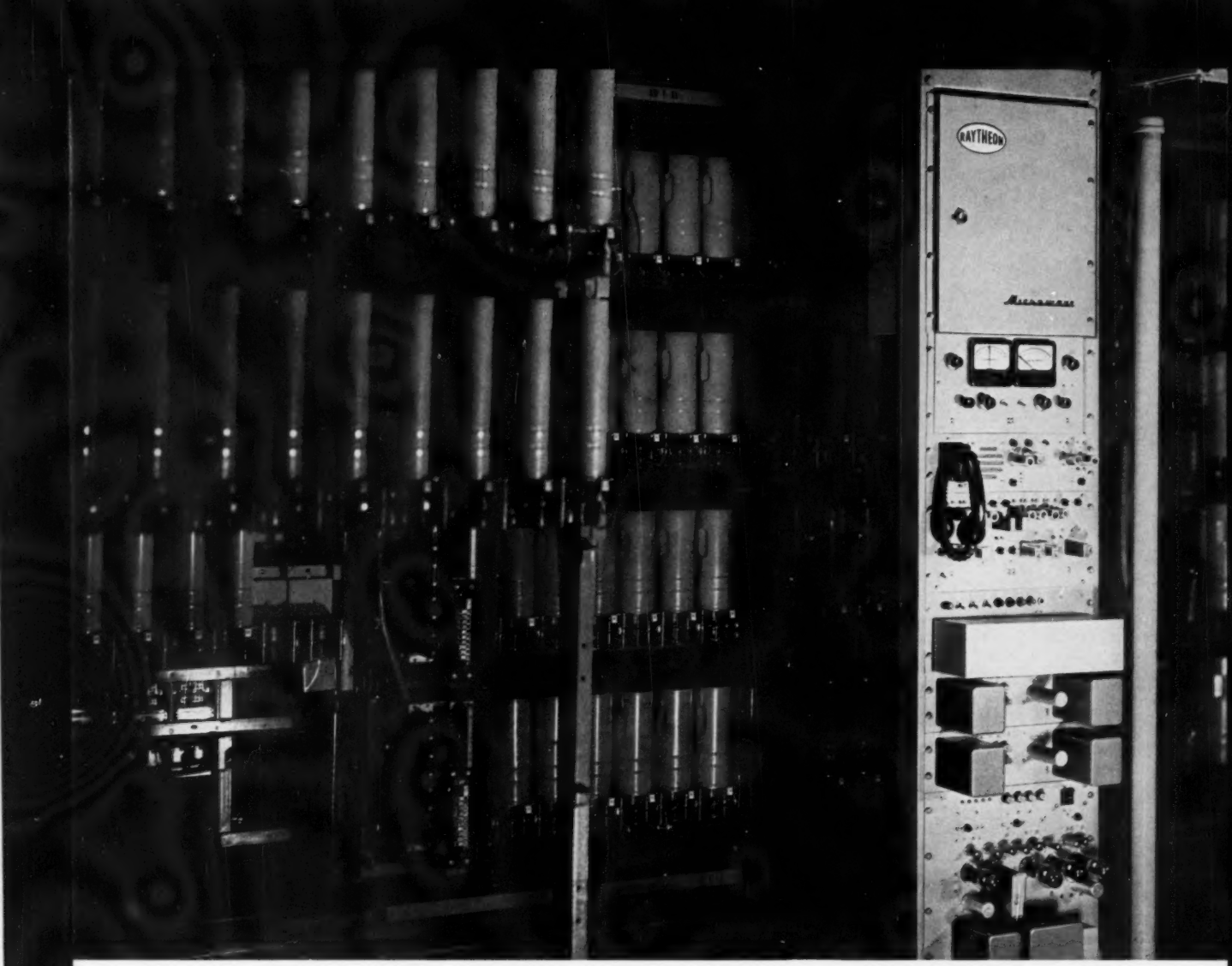
Situation No. 2

Our second concentrator was installed this past Spring, partly based upon the excellent results we received from our first one. It is not a special case, but is in a residential area that may be like many of you have in your own towns. The cable plant, as I mentioned before, was installed in 1926 and at that time the area was thinly populated with houses; entire blocks void of homes; an adjacent block with only three or four houses in it. And, frankly, in 1926 this area was "on the wrong side of the tracks." Many homes did not have telephones in those days and those that did were mainly on four-party lines. When the cable plant was installed, there were about three times too many pairs for the actual telephones in service. (I've blessed that plant engineer many times for his foresight.) Well, houses have popped up here and there to fill the vacant lots. The whole complexion of the area has changed. It is no longer "on the wrong side of the tracks." The original cable was sufficient until about 1958, when we had to restrict new installs to four-party service. A new 28 bed hospital was built in one of the vacant blocks and we had to back-string with drop wire to get three trunks for its PBX board.

Here seemed to be an ideal spot for a concentrator. It was an old established residential area in the form of a triangle, blocked from growth on two sides by the railroad tracks and on the third side by an already built-up area. Thirty-five pair properly spread throughout this six-square block area would solve the problem. We would be

(Continued on page 150)

Left to right: C. H. Reese of Moline, Ill.; A. R. Teifeld of Pittsburgh, Pa.; Keith Vogt of St. Paul, Minn., and Carl Schwob of Chicago.



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Report of USITA Traffic Committee

By D. A. PERIGO, *Chairman*

THE RESPONSIBILITY of the Traffic Committee of the United States Independent Telephone Association is to "consider general problems pertaining to traffic and particularly the improvement and standardization of traffic operations of Independent companies."

The chairman of the Traffic Committee is also a member of the sub-committees for Direct Distance Dialing (DDD), Mechanized Operator Toll Ticketing (Mark-Sensing), and All Number Calling (ANC). A meeting of the full sub-committee for Mechanized Operator Toll Ticketing with representatives of the Bell System was held in January, 1960. In April, 1960 the accounting and traffic representatives again met with Bell System representatives. A meeting of the sub-committee for All Number Calling with Bell System representatives took place in June, 1960 and was followed by a meeting of the regular Traffic Committee at which all members were present.

All sub-committee proceedings were discussed in detail in the Traffic Committee meeting which also developed the program for the Traffic Conference at the 1960 convention.

In our 1959 Traffic Conference the committee made the following report in connection with Direct Distance Dialing:

"Direct Distance Dialing is an important development in the art of telephony, but there are many aspects which should be studied by each individual company before jumping into a DDD program. Consideration must be given to the receiving of DDD calls. Included in this part are the costs of seven-digit numbering, satisfactory intercept service, and the number and quantity of trunks.

"The originating of DDD traffic requires expensive equipment. The savings in traffic and accounting expenses must offset the maintenance and the expenses associated with investment—principally depreciation and taxes. This committee urges each company to make detailed studies of the economic feasibility before ordering DDD equipment. There will undoubtedly be a time when DDD will be demanded by the public just as local dial has been. For the next few years, however, this committee feels that DDD should be established on the basis of economics and for growth."

The committee, after full discussion, can find no reason to change its recommendation. Some additional ideas in connection with person, collect, and special services, however, will be covered by one of our speakers at this conference.

In connection with Mechanized Operator Toll Ticketing (Mark-Sensing) the Traffic Committee strongly recommends that an Independent company should adopt this method of ticketing *only when its studies indicate the economic feasibility in that particular company.* The committee opposes "climbing on the bandwagon" for no other reason than because some other company does it.

The Traffic Committee completely endorses the theory of All Number Calling. It recommends the adoption of ANC at the time of dial conversion or when total number changes are required for equipment reasons. Where 2-5 numbering is already in use, this committee believes that a gradual shift to ANC by using it for new connections is the economic way of accomplishing the result. In all cases, this committee recommends that a sound public relations program be set up to give the public the full story before any changes are made.

The committee has investigated the background and the basic studies made by the Bell System in developing new toll coefficients which became effective for Bell System comparative purposes on Oct. 1, 1960. Independent companies which are not on a cost settlement basis may have little or no interest in these coefficients. As to those companies which do settle on a cost basis, the committee sees no way of predetermining the effect on settlements. The committee recommends that each cost settlement company prepare a toll supplementary peg count on both bases in order to determine the effect. We believe any effect on the settlement will be small, unless there is some unusual circumstance in connection with geography and type of traffic involved.

The members of the Traffic Committee offer their services to the Independents in connection with the Traffic problems of individual companies.

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"Political liberty does not consist in an unlimited freedom. . . . We must have continually presented to our minds the difference between independence and liberty. Liberty is a right of doing whatever the laws permit, and if a citizen could do what they forbid, he would be no longer possessed of liberty, because all his fellow-citizens would have the same power."—MONTESQUIEU.

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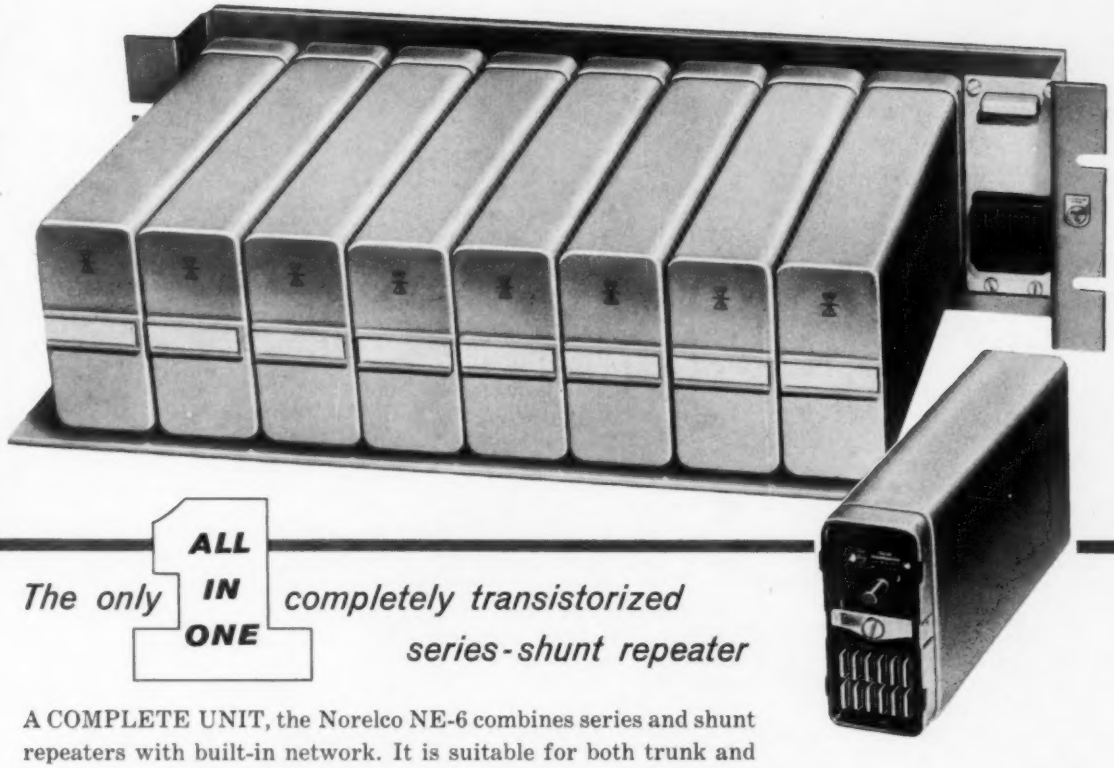

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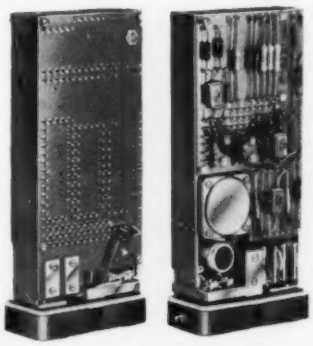

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Traffic Looks at Person, Collect, Special Service DDD

By JOHN B. NOGGLE*

(A Traffic Conference Address)

DURING THE past decade we have become familiar with the service improvement and operating economies accomplished with DDD (Direct Distance Dialing) automation. It is significant, however, that, until 1958, DDD systems, could only handle station-to-station sent-paid traffic. This year several of our manufacturers have systems which will handle Person, Collect and Special Service DDD and the purpose of my talk is to discuss the importance of this development in our service and operating efficiency.

We offer two rates of toll service, station-to-station and person-to-person, to our coin and non-coin customers. We also provide five methods for these calls to be billed—Paid, collect, credit card, third station charged calls, and special reversed toll or enterprise calls. In addition, we furnish essential special services by accepting time, charge and notify requests, and through our delayed procedures.

Person, collect and special services on DDD, as we know them today, admits to the customer dialing from non-coin telephones of station and person traffic. It permits messages to be billed as paid, collect, credit card or third station charged calls. Some systems can handle time, charge and notify requests. There also exists some coin telephone limited toll dialing. None are arranged at present for enterprise or "WH" traffic.

For the past two years I have been intimately acquainted with person, collect and special services on DDD. I prefer to call it Premium DDD, and will throughout this talk, because operator work is premium work and all these calls, with the exception of station-to-station sent-paid calls, require operator work for their completion.

A premium system adds to station DDD equipment the means for operator control of the class of service, call announcement, and start of conversation timing. I have knowledge of three different systems which are fundamentally the same, though they differ in arrangement and may vary in manipulation. The sequence of advancing a call is common to all the systems so let us review an inter-state, person-to-person, sent-paid call from the standpoint of the customer, the operator and the DDD equipment.

After receiving dial tone our customer dials an access code which will connect him to the DDD equipment; he will then dial a Premium code of one digit which is a signal to the equipment that a control operator is required to classify and announce the call and start the conversation timing; next he dials 10 digits consisting of the three-digit Numbering Plan Area code, the three-digit distant central office code and the four-digits of the called telephone number. When he completes dialing, the equipment advances a line signal to the operator and, upon her answer, our customer would hear a triple order tone. This is his signal that the operator is on the line and awaits his special instructions on the call. Our customer immediately passes his instructions, "I want to speak with Mr. Jones." Toll line sending started when the operator answered the line signal and, after a brief interval, ringing would start at the distant station and an answer would be obtained. The operator would announce, "I have a long distance call for Mr. Jones." When Mr. Jones acknowledged he was on the line, and conversation started, the operator would leave the circuit.

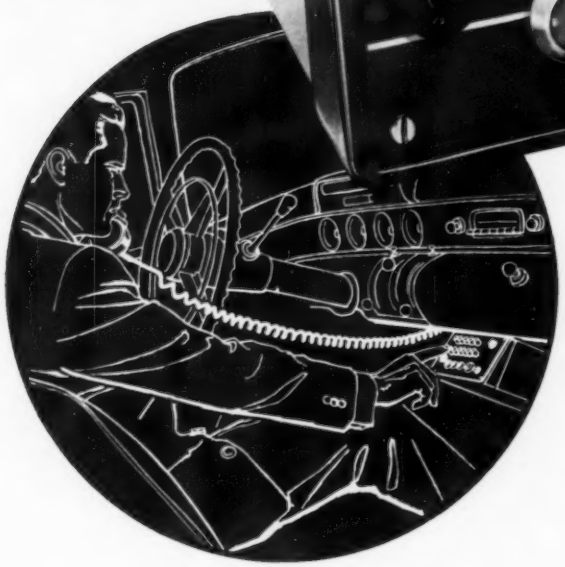
What work has our operator done in processing this call? When she received the line signal she knew the call would be advanced over the toll line automatically upon her answer. As soon as she received the instructions that her party wanted to speak to Mr. Jones, she knew it was a person-to-person call and operated a key to mark this class in the equipment. When conversation started, she operated a start-timing key and left the connection.

The equipment functions are the same as found in station DDD with three exceptions. The exceptions are the recognition of the Premium Code digit for operator control assistance, operator classification of the call, and operator actuation for start of conversation timing. The ticketing equipment received and stored the calling telephone number, the called area code, the called central office code, the called number, the class of call, and accumulated the minutes of conversation after start of timing. This equipment also obtained instructions from a routing translator, selected the proper trunk and spilled forward the required digits. At the end of conversation, the stored information was transferred to a physical record and another associated unit at that time provided the time of day and the date. The end-result is a record that contains all the information required to rate and bill this person-to-person toll message.

Collect calls are handled in the same manner as our person-to-person sent-paid example.

Credit card and third station charged calls require the control operator to record the called number, the number designated for billing and the time and date upon a memorandum ticket which

*Mr. Noggle is Division Traffic Manager of Virginia Telephone & Telegraph Co. of Charlottesville, Va.



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is forwarded to the accounting department. The operator marks a special classification on the DDD message so the accounting department may isolate the machine message and associate it with the corresponding memorandum ticket to complete the information required for billing.

It is difficult to advise you what to expect in a Premium DDD system. Following is a list of features, existing or planned, in the systems I have seen. I do not believe any single system now contains all of these following features.

(1) Recorder line lamp and/or call waiting lamp—to signal the operator that a DDD call is awaiting disposition.

(2) Recorder busy lamp—required when operators have access to recorders.

(3) Through supervision to calling number.

(4) Calling number display—A visual indication to the operator of the calling telephone number stored in the recorder.

(5) Calling number delete—To delete the calling telephone number in the recorder.

(6) Calling number re-entry — To reinsert a corrected, or different, calling telephone number.

(7) Calling number control—A means whereby the operator controls the calling line as long as she is in on the connection.

(8) Ringback—A means for the operator to ringback the calling party if he leaves the line.

(9) Through supervision to called number.

(10) Called number display—A visual indication to the operator of the called numbers dialed into the equipment.

(11) Called number delete—To delete a called number.

(12) Called number re-entry — To put in a new, or corrected, called number.

(13) Resending on toll line—A means whereby the operator can resend the called telephone number without rekeying or requiring the customer to redial.

(14) Toll line release—The means for the operator to release the forward toll connection so that toll circuit time is not occupied while customer instructions or operator reports are being made.

(15) Remove audible ringing — To remove audible ringing when it interferes with the operator obtaining details or instructions from the calling customer.

(16) Connection splitting—To split the calling customer from the called customer when a delay is required after the called station answers.

(17) Time start—To start the equipment timing of conversation.

(18) Time stop—To interrupt timing of a conversation in the event of error or wrong party on the line.

(19) Incomplete information guard —A safeguard against calls proceeding when equipment information is incomplete.

(20) Operator initiated or subsequent attempts—The means for an operator to access a recorder so that she can key in the necessary call details and have the equipment automatically send the call and record the subsequent message information.

(21) Toll switching access—A means whereby the operator can recall the calling station through the DDD equipment.

(22) Coin control—A means whereby the operator can actuate coin collect or return through the DDD equipment.

(23) Checking operator — A checking operator obtains the calling telephone number and keys this number into the equipment.

(24) Automatic number identification—A means whereby the equipment automatically identifies and stores the calling telephone number.

(25) Cordless control positions—Console type positions which provide all the control features required by the operator to control DDD calls.

(26) Combination cord type toll, DSA and DDD control positions—Existing toll positions that are modified for DDD control, and which have the capability for combined operation.

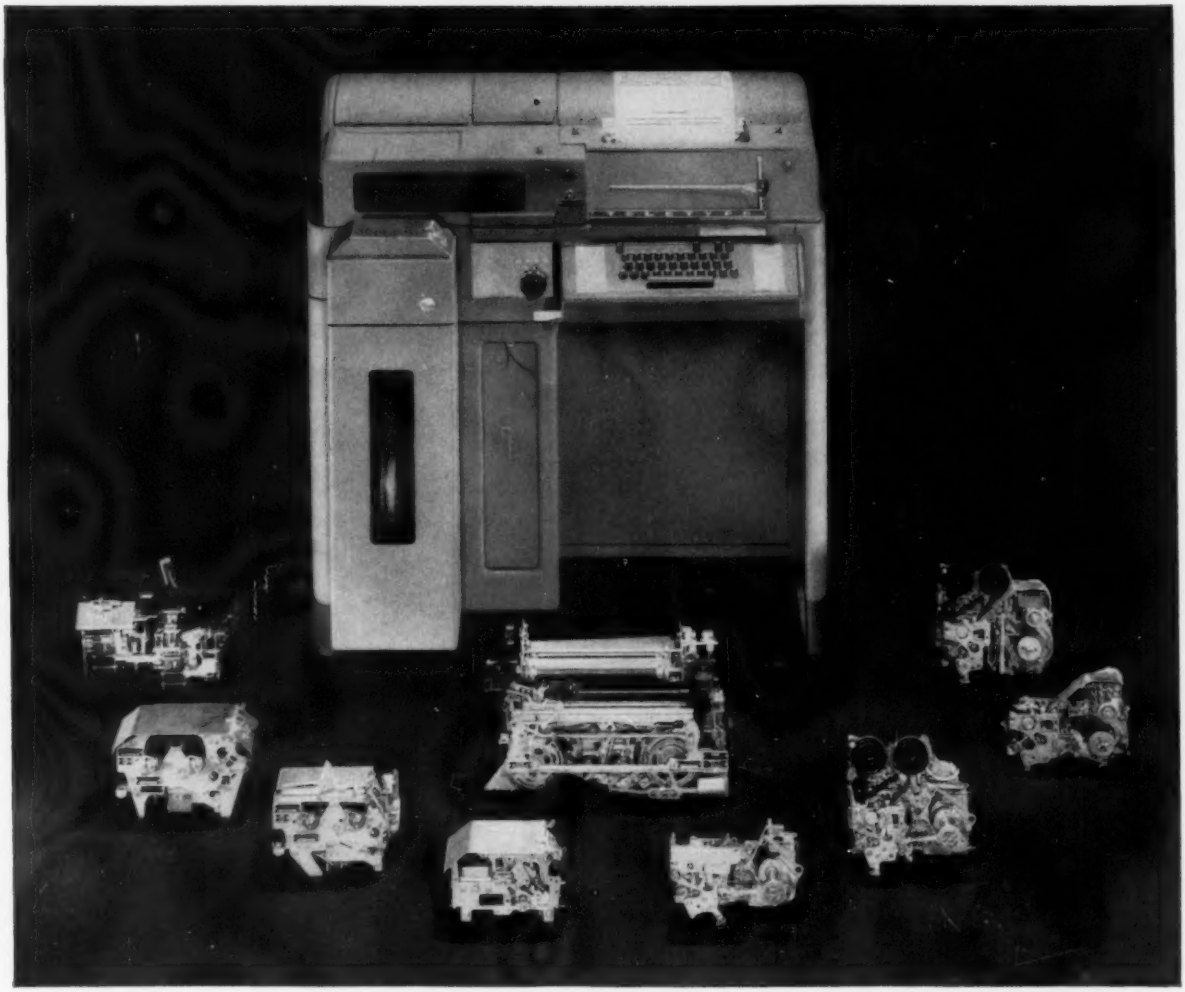
Central Telephone Co. has been conducting a limited field trial of person and collect DDD in North Carolina since May, 1960. I would like to discuss some of our experience which I believe will be characteristic in every system developed.

Objective speed of answer for DDD control operation is in the neighborhood of 3 per cent over five seconds. Meeting this objective yields an average answer of one second. This is a substantial improvement over the present CLR objective of 7 per cent over 10 seconds. Experience shows the customers recognize this speed as improved service and express it first in their comments.

Premium DDD control operation differs from normal CLR operation, in that the work time on a call is continuous, except for time and charge, notify, and overtime collection on coin traffic. This influences the percent occupied time in the calculation of the coefficient and results in about 65 per cent occupancy to maintain the objective speed of service. Our service observations to develop work time coefficients by class of call produced the following results:

Left to right: Frank M. Clark of Potosi, Wis.; Jerry Hunter, Clifford Poisel and Donald Adams, all of Hebron, Ind.

Left to right: R. J. Surgi of New Orleans, La.; Roy Brooks of Florence, Ky., and Daniel Seitz of York, Pa.



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Class	*Average Work Time Interval*	*Coefficient*
Person-to-Person Paid	62 seconds	6.10
Person-to-Person Collect	73 seconds	7.17
Station-to-Station Collect	52 seconds	5.11

These coefficients were developed on an automatic number identification system and should be increased .5 units per call where a checking operator must key the calling telephone number. Station-to-station sent-paid traffic will also require the application of a coefficient of .5 per call if a checking operator is required. These coefficients are not adjusted for team size.

Per cent completion on station-to-station sent-paid DDD should be about 80 per cent. Person and collect will develop a completion of about 50 per cent. The over-all completion should range between 50 per cent and 60 per cent, depending on the ratios of attempts for the different classes of dialable calls. It should be noted that DDD completion is computed on an attempt basis and any comparison with equated studies must include initial and subsequent toll line attempts. Under the new peg count procedure, the sum of busy and other reports would be the equivalent of total attempts.

Our experience in work time savings for person and collect traffic is approximately 50 per cent when related to work time per DDD network attempt. It is not prudent to rule of thumb the work time savings on a manual call basis, because the ratios of different classes and their ratios of attempts will affect the result. The coefficients permit a more accurate individual office analysis.

At the present time, over 3,000 exchanges are included in the nationwide DDD network. These exchanges are equipped with ANC or, 2-5 numbering, and arranged with the required transmission, signaling and special features. They serve some 50 million telephones, which are about 70 per cent of the total stations in our nation.

Left to right: Carl Smith of Leeds, Ala.; William B. Cox of Cornelia, Ga.; Harold C. Ebaugh of Havre, Mont., and D. W. Wright of Hutchinson, Kan.

DDD offers many direct and indirect advantages to the departments other than traffic. Premium DDD extends commercial services and accounting efficiency to the heavy users of higher rated toll and to the consumers who require our essential services for their successful operations.

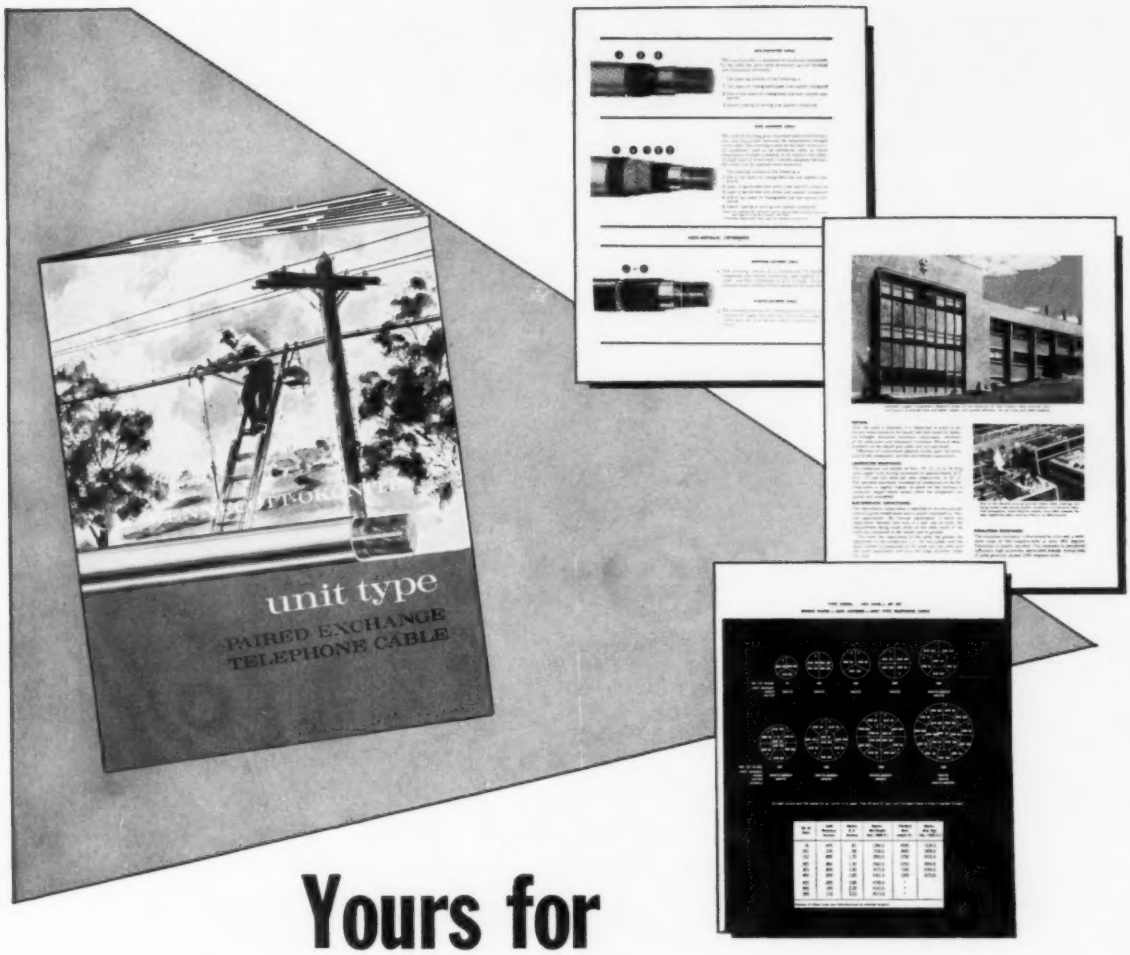
Some offices equipped with Premium DDD find about 95 per cent of DDD network traffic, from non-coin subscribers, is customer dialed. Significant, too, are findings that percentages of toll errors and adjustments for messages billed are related to the method of toll operation. AMA type DDD, which operates with automatic calling number identification, develops about 2.5 per cent toll billing errors and adjustments, CAMA, or operator identification of calling numbers, develops about 3.5 per cent, and manual operations develop about 4.5 per cent. The percentages for DDD includes wrong number billing occasioned by customer and equipment errors which account for approximately 2.0 per cent of the total errors and adjustments.

I am personally enthused over the development of Premium DDD and feel it a major step towards total DDD. Total DDD means that either our customer or operator can dial every type of call so that message detail is machine recorded to admit full automation in the accounting and billing of toll business. Our manufacturers and scientists are aggressively developing the means for this eventuality. We operating people can assist this progress by communicating our needs and by being open-minded to changes of restrictive operating methods and administrative procedures.

I have formed a concept of the ideal DDD system from my experience with Independent manufacturers and Bell System operating people. All of us are seeking systems compatible with the present and adaptable to the future.

My ideal is a system which has the capability for total DDD; a centralized system which has the means for handling the non-coin station, person, collect and special services DDD and which admits to the known potential to include coin, Enterprise, "WH," and inward traffic in its operation. I look also for a possibility to operator dial non-network traffic through recording equipment to take advantage of some traffic work time savings and accounting automation in the rating and billing operation. If we get all this we may be content. However, by that time progress will have placed more objectives on our horizon.

Left to right: Ray Blain, TELEPHONY's technical editorial director; Fred Beckman of Springfield, Ill., and J. F. McHenry of Jefferson City, Mo.



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Long Range Functions of the Traffic Department

By WILLIAM A. KERN*

(A Traffic Conference Address)

MY EARLIER training in the telephone industry was in the traffic department. I consider this fact to be on the asset side of the personal development ledger—and it also makes me feel at home in talking with you folks today.

When I looked back at our traffic operations of a few years ago, I began to realize that, today, a great many things have changed. I began to wonder about the future of the traffic department—and what we should plan for that future, hence my subject "Long-Range Functions"—and I'll be content to look only as far as 1970.

It seemed to me, in planning for the future, we should decide what functions belong in traffic and then look at some of the changes which have taken place.

When I began to think of "functions," I considered such things as force adjustment, training, practices, and engineering which lead me to a question, "What is really the traffic department's responsibility?" In searching for a definition, I ran across the one given by Gray Beck at this conference last year—which I'll quote:

"This responsibility can be simply stated as the acceptance of every offered call with the intention of completing it as quickly as can be done economically regardless of the destination of the call, that is, whether it goes across the street or to the other side of the world—and also, regardless of whether it is handled manually by an operator, or whether it is dialed directly by the customer."

Do you agree with me that force adjustment ties in with "as quickly as can be done *economically*," that practices tie in with "regardless of the destination," that engineering has something to do with "whether it is handled manually or dialed directly," and that certainly training ties into the entire problem? Yes, I think we can accept Mr. Beck's definition of traffic responsibility.

A few years ago, most local calls were manually handled, and here was the practice:

Operator: Number Please.
Subscriber: 1562.
Operator: 15 — 62?
Subscriber: That's right.
Operator: Thank you.

Then we made some progress and the operator repeated only when she wasn't sure of the number, and we had:

Operator: Number please.
Subscriber: 1562.
Operator: Thank you.

There were very few seconds involved—maybe three seconds—on each call but it made it possible to handle about 40 per cent more traffic on the same positions and with the same operators. This was not enough. We were forced into dial operation because of economic factors—and also some biological ones. The parents just were not producing baby girls fast enough to supply us with operators.

Dial operations expanded with various types of equipment—step-by-step, rotary, panel, crossbar, and now electronic switching. Please bear in mind the speed with which these changes have taken place. I shall not point out either your age or mine by mentioning a specific time. Pick your own point of reference and think of the speed of change since then.

Now take a look at the toll picture. I'm sure there are some people present who can remember when toll tickets were written at "recording" positions, the subscriber dismissed, the ticket passed to the "line" positions where the calling party was called back to talk on the call. Parenthetically, I should say this was about as positive a station identification as you could get. There came the advance to CLR, a common expression today, which means "Combined Line and Recording." The same operator who recorded the call held the subscriber on the line while attempting completion. As in the local illustration this saved time.

Following this came what is known as "overlap recording" which means the operator asks for the calling number after passing to the terminating operator—another time saver. Then we eliminated the inward operator wherever possible by toll line dialing. And now we have subscribers dialing their own toll calls just as a few years ago we put local calling on a "self service" basis.

Again, after all these time-saving practices, there have not been enough girl babies to keep up with the need for telephone operators.

In recent years, we have had another development which is neither local nor toll, but which has had a profound effect on both, namely, Extended Area Service. This development has also reduced our need for operators.

By this time, I think I have given enough history—and mentioned telephone operators to the point where we can begin to examine the future.

As we look at long-range functions of the traffic department I think we should constantly keep people in mind, for with each function we must consider not only the number but the quality of the people we shall require—and keep in mind that it is traffic's respon-

(Continued on page 124)

*Mr. Kern is President of Rochester (N. Y.) Telephone Corp.

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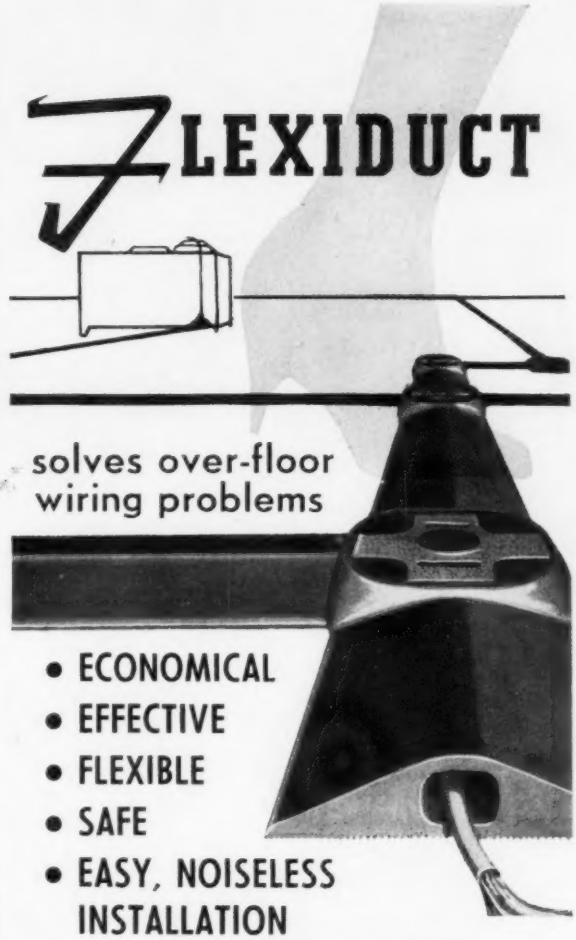

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sibility to keep our products—telephone traffic—moving.

We have heard much of the advent of electronic switching — and a few miles from here an experimental office is in operation. To the best of my knowledge this is the latest idea for handling local traffic. Remember, I limited my views to the next 10 years, and I don't believe there will be very many electronic offices during that time. This means we will continue to use a lot of the kinds of dial equipment we are already using. One of the long-range functions of the traffic department, then, will be to manage the present types of dial offices in such a way that our subscribers will receive good service while the equipment is used at high efficiency.

Mr. and Mrs. John W. Wopat of Fairhaven, N. J.

One of the things that has always bothered me about a dial office is the percentage of idle time over a 24-hour period. In order to get some idea about how much there is, I multiplied some busy hour peg counts by 24, then divided it into the total day peg count. This told me that if the equipment was carrying a full load in the busy hour, there was 58 per cent idle time over the remaining 23 hours. Now if you have been engineering your dial offices according to the "good book," the only time you will have a full load is just before you make the next addition. This means, then, that most of the time the equipment is idle *more* than 58 per cent.

Well, I don't believe we should change our subscribers' calling habits, because we want them to use our service whenever they need it—but I think one of the long range functions of the traffic department is to find a way to keep the switches at just the right capacity to handle the busy-hour traffic. In a multi-office company which uses the same type of equipment in several offices, this might be done by moving switches from one office to another as needed. A single office company might install the frames and banks and make a deal with the supplier to furnish the switches as needed.

You have a right to ask why I place importance on this item. My first reason is to minimize the investment. In addition, I am convinced that the subscriber who regularly encounters a short wait for dial tone, or a paths busy, will be less critical than one who receives immediate dial tone and no paths busy for one and a half years, then for six months' experiences, what to him is, a badly declining service.

This all boils down to the fact that one of the functions of the traffic department is to find a way to provide dial service on a one delay in a hundred basis throughout the engineering period instead of at the end of it.

Unquestionably another function of the traffic department will be to find ways of handling the ever increasing toll traffic without adding people. The way I keep coming back to this subject, you may get the idea I'm against having people around—and that certainly is not the case. I'm simply looking at the arithmetic and recognizing the fact that, right now, there are companies which are having a tough job finding operators to handle the present traffic.

One of the ways of doing this is through the use of Direct Distance Dialing not only of station traffic but the person and collect traffic as well. Fortunately I knew in advance a part of this program would be devoted to this item, so I merely mention it to show that it is recognized as a traffic function during the next 10 years.

You have all probably heard of the dialing code for customers to reach Information in distant numbering plan areas. I refer to 555-1212 preceded by the area code. This is the first step toward some form of centralized Information—but like a baby's first step it is a very small one. One of the traffic functions during the next 10 years will be the solution to this problem. Most of the places where this has been established are on a very limited basis. Perhaps all of our Independent friends are sitting back waiting for the Bell System to solve the problem since the NPA's are all set up with a Bell office as the hub. The solution to the problem may be a centralized Information Bureau some distance from the primary center where there is available labor. Who knows? Some Independent company may come up with a solution which would make it possible to sell its service to the Bell company. At least we can agree that the solution to this problem is a traffic function.

F. O. Dixon (left) of Knoxville, Ia. and C. B. Brecheisen of Dodge City, Kan.

There is no doubt in my mind but that wages will go up some more in the next 10 years. This places a premium on efficiency. It means that one of the traffic functions will be an ever-alert force adjustment. This can be accomplished only through the closest attention of chief operators. Basically, force adjustment is a matter of arithmetic but this part of it is merely the foundation. The actual accomplishment of efficient operation results from the sound judgment exercised by the chief operator on a daily and even hourly basis. One of the big problems seems to be incidental absence.

As I see it one of the big jobs during the next 10 years will be to sell the idea that there is more enjoyment to be had by being on the job handling telephone traffic than there is by reporting off, then going on a picnic.

History is full of stories showing the telephone operator's devotion to duty—but at the moment it seems we are in a period of indifference. We are living

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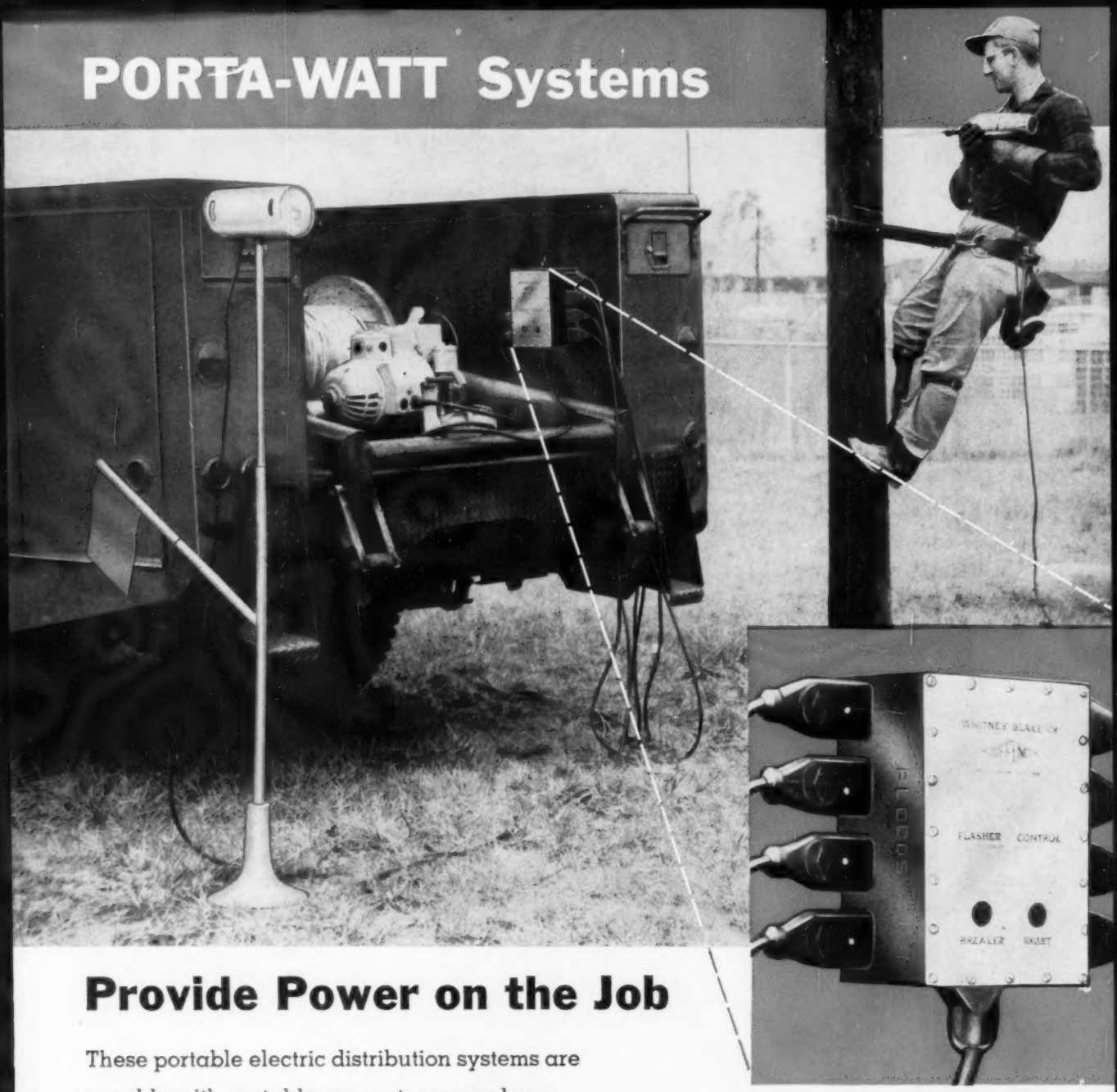

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in a generation that has been taught to "get all you can" instead of "give all you can." Since traffic work is so different from other jobs, because every call must be handled when it is offered, it means that regular attendance is a lot more important in traffic than in some other places.

I have mentioned the point that I believe wages will go up in the next 10 years—and I meant *in general* this would be the case. It seems to me that we owe it to ourselves to see that traffic wages are competitive with those in other departments. I would think it is a traffic function of the next 10 years to make sure this is accomplished. I believe it is self-evident that unless this

C. F. Fiore (left) and A. J. Falk, both of Washington, D. C.

Mr. and Mrs. John R. Henninger of Butler, Pa.

is done we will wind up with an unbalanced work force where the talent is every place except traffic—and yet we will depend on traffic to keep our products on the move.

It is my impression that our toll traffic is more volatile than ever these days. This is probably caused by the instantaneous transmission of news. Our entire business world is based on activity at a very fast pace. A business man driving along the highway gets the news on his car radio. He hears an item that may have some effect on his business. He either uses his mobile telephone or heads for the nearest pay station. These are not local isolated situations, but far reaching cases—all affecting traffic. Why should a hurricane along the east coast distort the telephone traffic on the west coast? It does—because people have moved there from the east and are still interested in relatives and friends. Maybe some are on vacation and worried about their homes. There are some who have business interests in both places.

I mention these items to emphasize that during the next 10 years traffic must develop force adjustment programs, mathematically to be sure, but also on the basis of sound judgment on the part of central office management. Sound judgment must be paid for.

I think there is a kindred item that goes along with force adjustment and training, so I'm going to talk about it right between these two items. We earlier defined the traffic responsibilities. How do you know whether you are measuring up? Are you depending on your subscribers to tell you? Most of them won't until your service is so completely bad they can't stand it anymore. During the next 10 years, I think it is a traffic function to appraise every item of service—and take the necessary action to provide whatever is necessary. The appraisals should include not only the speed of service, but the quality as well. On operator handled toll you need the speed of answer (which ties in directly with force adjustment). How many mistakes do your operators make in reaching wrong numbers, recording wrong calling numbers? Are you sure your transmission levels are satisfactory? How much time is wasted by operators using irregular practices? How is your subscriber's service affected by equipment difficulties in some other company's office? Are your operators timing toll tickets accurately?

Now let's look at the "self-service" part of the business. Do your subscribers always wait for dial tone before dialing? Do they all know what digits must be dialed? Do they consult their directories, or do they call hit or miss disturbing other subscribers with wrong numbers? What is your speed of dial tone? Are you encountering paths busy in your machine? What part? Does the subscriber reach a wrong number because the equipment didn't function properly?

These same questions can be applied to DDD operations. Where you have operator identification, I can think of a few other questions. For example I've been told there is a problem of wrong calling numbers. Why? Does the customer give a wrong number? Does the operator key the wrong one? Does the equipment fail to record properly?

Let's not miss the point that we need some answers to questions concerning information and intercept also, but I

Left to right: R. A. Dwyer of Brookston, Ind.; James C. Hageman of Lorain, O.; K. L. Lawson of Lincoln, Neb.; Mrs. Albert Dalke of Medford, Wis., and Mr. Dalke.

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don't want to bore you. I do want to make a point that we could go on and on with such questions, but you can't give the answers without having some form of service appraisal.

I've mentioned force adjustment and its importance. Wouldn't it be rather foolish to spend a lot of operator and supervisory time working on the wrong items? This can happen unless you have a program. In the next 10 years, such a program is a vital traffic function.

When I mention the subject of training I'm making it all inclusive, from the initial training of an operator to follow-up training of general traffic managers. (I stopped with general traffic managers only because this is a traffic conference, but I think it is apparent that if some of the functions I mention are to be carried out you traffic people must train some general managers and some presidents also.)

In mentioning training, I'm making the assumption that you are obtaining qualified people, because if you are not, no amount of training will compensate for the lack of such people. If you can find qualified people, I think the training interval for operators can be shortened and you will at the same time develop the nucleus of a good supervisory organization. Training is of the utmost importance in the central office organization—but it has just as much importance in the way you do your statistical work, your traffic engineering, and your force adjustment.

As I see the training job of the next 10 years, it not only includes the way to get the job at hand done but also the constant challenge of the job ahead. It means training people to think, to sponsor new ideas, and to have no fear of controversy.

In the historical part of this talk I referred principally to changes in our operating practices. Perhaps reference to practices is a good way to conclude my remarks also. Generally speaking, Independent companies have sat back and accepted Bell System practices. There is no reason why Independent companies cannot pioneer. If one of your operators has an idea about a practice change that helps toward better customer understanding, or speedier service, try it out and if it is good recommend it. For example, someone must discover practices that will reduce the abuse of our Person traffic as well as our Collect, Third Number, and Credit Card practices.

I fully believe that a great deal of the success of our industry depends on how well the traffic department manages the handling of the company's product—telephone messages—over the next 10 years. Traffic engineering, force

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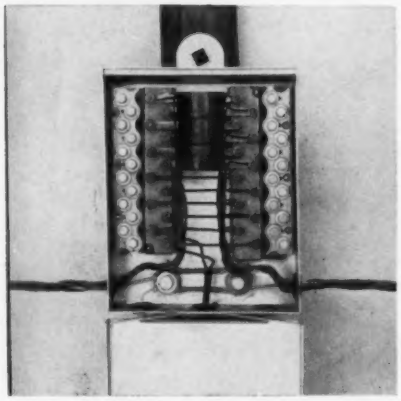

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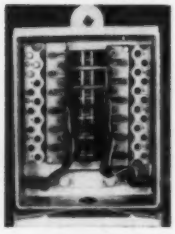

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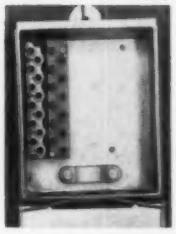

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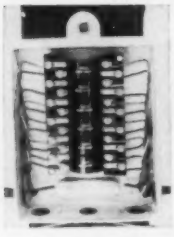

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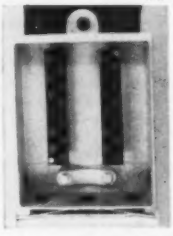

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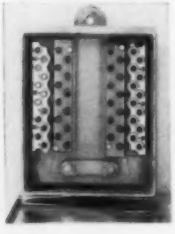

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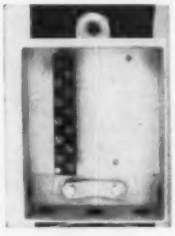

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USITA CONVENTION

Continued from page 21

R. E. Rudolph of Ellensburg, Wash.; executive vice president, Clyde S. Bailey of Washington, D. C.; treasurer, Carl D. Brorein of Tampa, Fla.; secretary, George C. Richert of Washington, D. C.; assistant secretary, Courtney S. Snyder of Washington, D. C.

This year's convention marked the 20th anniversary of service to the USITA by Executive Vice President Clyde S. Bailey, and he was presented a suitably inscribed watch by the USITA directors and a plaque by the association, commemorating his long service with USITA.

Mr. Bailey also was presented a certificate of appreciation at the final session of the convention.

At the closing session, Immediate Past President Foster B. McHenry was presented a plaque, on behalf of the USITA, by Hugh A. Barnhart, in recognition and appreciation of Mr. McHenry's service as president of the association during the past year.

To provide a permanent record of the convention proceedings for those who did not get copies of addresses, and for those who did not attend the convention, TELEPHONY, as in the past, is publishing, on succeeding pages, all addresses given at general sessions and conferences, copies of which were available.

REPORT OF EXECUTIVE VICE PRESIDENT

Continued from page 30

of the policy-making in the common carrier field is essentially done at the staff level.

(a) *Will There Be Another Interstate Rate Reduction?* The spectre of another possible interstate rate reduction showed up early last Spring and Summer.

It all started by a letter dated Feb. 4, 1960 from Chairman Emanual Celler (D., N.Y.) of the House Judiciary Committee to the chairman of the Federal Communications Commission suggesting the propriety of a reduction of 70 million dollars. Congressman Celler arrived at this figure by assuming that a 6½ per cent return on net book cost was a reasonable one, whereas the return actually earned was in excess of 7 per cent. He also drew attention to

action by the FCC in 1953 granting a 65 million dollar increase "designed to bring the (Bell) system's rate of return up to a level of 6½ per cent."

"By this action," the congressman said, "the commission obviously considered a 6½ per cent rate of return as the maximum necessary to ensure the financial integrity and safety of the plant devoted to the furnishing of interstate telephone service." He also reminded the commission that in September, 1959 interstate reductions in the amount of 50 million dollars were negotiated.

Chairman Ford on Apr. 27, 1960 wrote the congressman that it "has had under active consideration and study the interstate operating results of the Bell System" and that "in another few months it would be in a position to ascertain the status of pending NARUC-FCC joint studies of telephone separations procedures." The Chairman said with respect to the matter of rate of return: "The level of earnings of 6½ per cent was regarded by the commission (in 1953) as being within a range of reasonableness and it does not necessarily follow . . . that it is representative of a maximum or ceiling rate of return. . . ."

It may be remarked here that neither Congressman Celler nor the judiciary committee has any more authority to ask the FCC to order a rate reduction than any other congressman or committee. The congressman's interest in such matters apparently arises out of the fact that his anti-trust sub-committee conducted a lengthy hearing a few years ago into the administration of the consent decree in the AT&T-Western Electric anti-trust litigation. He followed up the hearing by calling on the federal commission to bring about an interstate rate reduction of 150 million dollars.

The commission took no action at that time, but it did negotiate a 50 million-dollar-reduction in the summer of 1959 which became effective in September of that year. Whether this reduction would have come about in the absence of any importunity from the congressman can, of course, only be speculated.

Our Independent telephone companies have a big stake in these maneuvers. They will expect to be kept whole in any possible reduction that might eventuate from current events. Without undertaking to pass judgment on what constitutes a fair rate of return, leaders in our branch of the industry point out that the Bell System could do much to alleviate its present problem if it would accept the USITA separations manual and on business inter-

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changed with Independent companies make settlement arrangements more closely corresponding to what justice and equity require.

In view of the interest which Independent companies have in any interstate rate adjustment, I addressed a letter to FCC Chairman Ford on June 29, 1960, pointing out the following considerations:

(1) That Independent companies originate and terminate approximately one billion messages each year jointly with Bell companies.

(2) That almost all Independent companies use average cents per message schedules to determine their participation in revenues derived from interchanged message toll telephone traffic.

(3) That the level of settlements in these schedules reflects the average revenue per message on all message toll telephone traffic originated by the customers of an Independent company, and that a reduction in interstate rates would therefore lower the average revenue per message and adversely affect the revenues received by Independent companies from interchanged business.

(4) That when interstate reductions were negotiated in 1941 and again in 1943 the commission stipulated that the Independents should be kept whole; and that in any future consideration of the matter of interstate rates the commission should accord to Independent companies at least the treatment found suitable and proper in those years.

(5) That, for reasons stated in the letter, more realistic consideration must be given by regulatory commissions to the rate of return element if telephone companies are to be able to plan ahead and acquit their full service obligations to the public.

(6) That following revision of the NARUC-FCC separations manual in 1957 the USITA prepared its own manual following the principles established in the regulatory manual, and that our manual is now the subject of litigation before regulatory commissions in four states.

(7) That if the USITA manual is sustained by regulatory authorities, as we believe the realities and justice demand, "substantial increased sums will be due from Bell companies to Independent companies to afford proper and adequate compensation to the latter for originating, terminating and other services on message toll telephone business."

In reply to my letter, Chairman Ford on July 11, 1960 wrote: "Please be assured that your needs will be given due consideration by the commission at such time as the matter of any litigation in interstate earnings is before it. However . . . the commission must in the exercise of its responsibility for regulation of interstate rates meet various types of situations as they arise. Therefore we cannot at this time commit ourselves to any particular course of action in this respect. We appreciate your interest in these matters."

In reply to a letter from Chairman Warren E. Magnuson of the Senate Interstate Commerce Committee, Chairman Ford of the FCC stated that the commission is currently engaged in conducting joint studies with the NARUC on separations procedures. He said that a revision of the procedures which would have the effect of transferring substantial amounts of investment from intrastate jurisdiction to interstate jurisdiction would materially affect the level of interstate earnings as computed under existing procedures.

Chairman Ford then added the following comment which could or could not be prophetic: "*The commission will be better informed respecting the status and possible outcome of the pending NARUC-FCC studies later this summer. No action will be taken by the commission relating to interstate rates until that time.* (Italics supplied)

In the meantime, it is known that the NARUC special committee of commissioners on telephone regulatory problems and its technical staff committee are devoting attention to these problems. It has solicited the cooperation of representatives of our association and of the Bell System.

This is the way the matter of a possible interstate rate reduction stands

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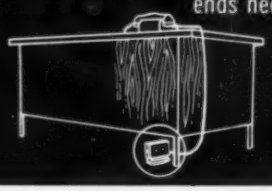

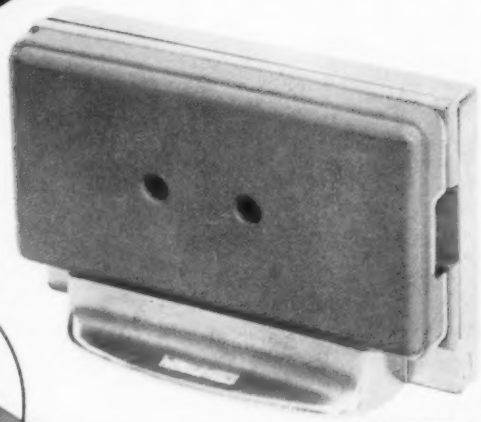

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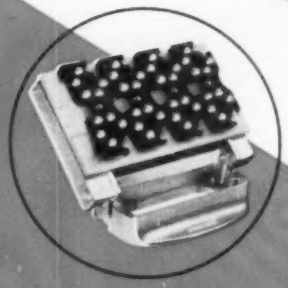

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at the time this report to our convention is being prepared—in the middle of September. Our Settlements Committee and the officers of our association are following all developments closely. . . .

(b) *General Microwave Case.* In my report to our 1959 convention, I referred to a decision of the FCC in August of that year in the general microwave case, Docket 11866. In the decision, the commission in effect opened the door to the development by private radio services of their own microwave radio systems. The commission used the following unfortunate language:

"It is abundantly clear that there is no express obligation on the part of the commission under the Communications Act of 1934, as amended, to protect the users of common carrier service from any adverse economic effects that the carriers might suffer in that connection."

The commission also dealt with the subject of interconnection between private and common carrier microwave systems in such a way as to imply sympathy for the fundamental idea of interconnection.

Because of the importance of the two issues mentioned our association, in September, 1959, filed a petition for reconsideration. The AT&T, General Telephone Service Corp., and Western Union filed similar petitions.

Opposition to these Petitions for Reconsideration was filed by the Minute Maid Corp., the Special Industrial Radio Service Association, the National Committee for Utilities Radio, the International Municipal Signal Association, the International Association of Fire Chiefs, the Association of American Railroads and the American Trucking Association. The major thrust of these petitions was a request that the commission remove its Stay on the microwave frequency allocations to each of the services represented. On Mar. 4 this year, the commission released a Memorandum Opinion and Order denying these pleadings.

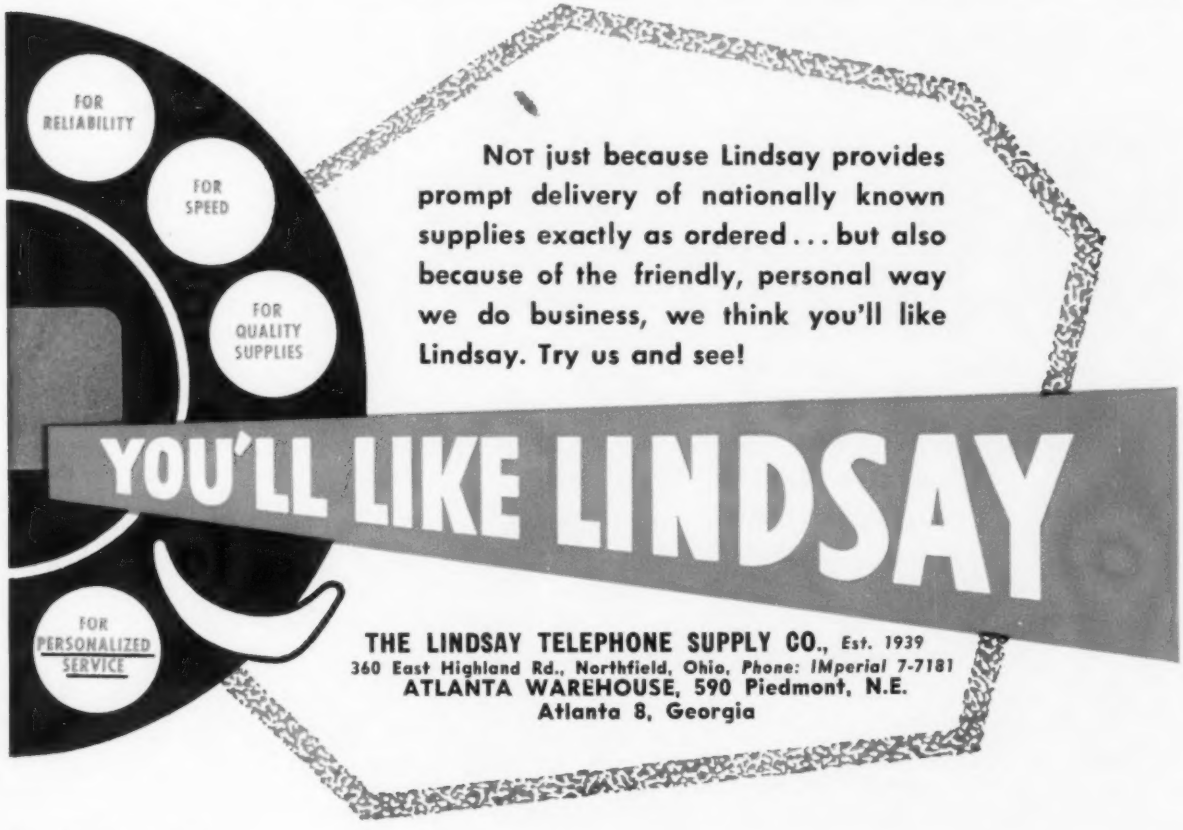
The use of microwave frequencies for space communications was not under active consideration during the original hearing phase of this docket in the summer of 1957. On May 20, 1960, the commission released an order reopening Docket 11866 for the sole purpose of receiving information on developmental plans for space communications and the potential frequency needs. At a one-day hearing on July 18 selected witnesses discussed space communications programs now under consideration and the potential frequency requirements of these programs.

No further action has been taken by the commission. The Stay upon the expanded allocations remains in effect until the Petitions mentioned are reconsidered.

(c) *Frequencies Between 25 and 890 Mc.* The Federal Communications Commission has not yet released its findings in Docket 11997, an inquiry into the allocation of radio frequencies between 25 and 890 Mc. Hearings in this proceeding, in which the chairman of our Engineering Sub-committee on Radio and Carrier and our radio engineer testified on behalf of our association, were completed in the summer of 1959.

Decisions of the International Telecommunications Union Conference in Geneva, Switzerland, concluded last December, have not yet been announced. These could have an effect upon final conclusions in Docket 11997. The major domestic issue which must be resolved by the commission before it can complete its findings appears to be a determination as to what to do about television frequency allocations.

(d) *The Physical Interconnection Case.* The physical interconnection case, Docket 12940, is an outgrowth of opposition by certain railroads to a revised private line tariff filing by the AT&T and associated Bell companies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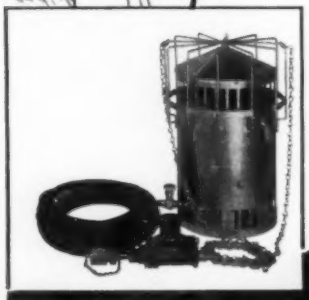

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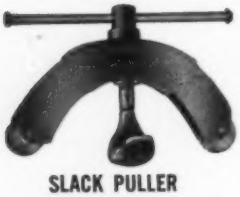

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specifying the circumstances under which physical connection between privately owned and telephone company common carrier communications systems would be made. The USITA filed a petition of intervention in the proceeding in order to be in a position to argue for an ultimate decision that will be in the public interest as we see it. Hearings began before Examiner Kyle in November, 1959 and continued through a total of nine weeks of testimony before the record was completed on May 10, 1960.

The issue involved is a warmly contested one, with the telephone industry on one side, important railroads on the other. AT&T Vice President George L. Best was on the witness stand for a full week giving direct testimony and submitting to vigorous cross-examination. Our association witness, Mervin H. Alexander, testified with respect to returns to a questionnaire relating to the contents of Independent company interconnection tariff provisions. . . .

Other Activities in Radio Field

The rest of our radio activity before the FCC has been concerned with technical and administrative matters. Responses to commission proposals have been filed covering such subjects as transmitter identification cards, relaxation of operator license requirements, the operation of control stations on 450 Mc, multiplex operation of FM broadcast stations, technical operation of TV translater and repeater stations, and use of 450 Mc frequencies for a public air-ground communications service.

In connection with the last item, the commission, on Feb. 19, 1960, released an order authorizing the use of frequency bands 454.40-455 Mc and 459.40-460 Mc for a two-way air-ground public radiotelephone service.

Increasing interest in dial mobile radio techniques has necessitated a series of meetings between our Radio and Carrier Sub-committee and Bell System representatives looking toward establishing an industry-wide approach to this important development in mobile telephone service. A tentative proposal for compatible public dial mobile telephone systems has been drawn up by this sub-committee and transmitted to interested manufacturers in this field for review and comment.

Our radio engineer, Thomas R. Warner, has prepared and published the first three of a series of radio booklets as a part of the Engineering Committee's recently inaugurated Engineering Bulletins. These have dealt with microwave radio problems. Forthcoming issues will cover licensing procedures, mobile radio, operating and

maintenance procedures and other items of interest to our members.

The use of radio by Independent telephone companies continues to increase. There are 103 Independent telephone companies operating 128 base stations in the Domestic Public Land Mobile Radio Service and 53 Independent companies with multi-station microwave systems in operation at this time.

Our Radio Engineer is secretary of the Telephone Industry Radio Coordinating Committee set up by our industry. In this capacity, he serves as liaison between the Telephone Maintenance Radio Service Division of the FCC and all individual telephone company licensees.

He also maintains up-to-date records of radio frequency assignment and usage by Independent telephone companies in the Domestic Public Land Mobile, Rural and Point-to-Point Microwave Radio Services, and assists in coordinating the use of frequencies between Independent and Bell operating companies when necessary.

Mr. Warner is also a member of the National Industry Advisory Committee to the FCC. This group is primarily concerned with Emergency Broadcast, CONELRAD alert, and Civil Defense Communications problems of interest to the commission. Our Radio Engineer also serves as Independent telephone company representative to the Telecommunications Division of the Department of State, and as technical representative of the USITA to congressional committees interested in radio frequency matters. . . .

Communications for Military

In the report I made to our convention last October, I stated that an investment of more than 2 billion dollars by the communications industry will be involved in connection with nationwide communication systems for the military and federal civilian defense agencies. More than 200 installations are scheduled to be made in Independent territory. Our Military Liaison Committee has the responsibility for maintaining contacts with the military, other federal defense agencies, the Bell System and the Independent manufacturers relating to these matters.

Since October, 1959, a number of important developments have occurred in the furnishing of communication facilities to the military. Our board of directors in March of this year adopted a recommendation by our Military Liaison Committee that the board resolution of March, 1959 relating to this matter be revised.

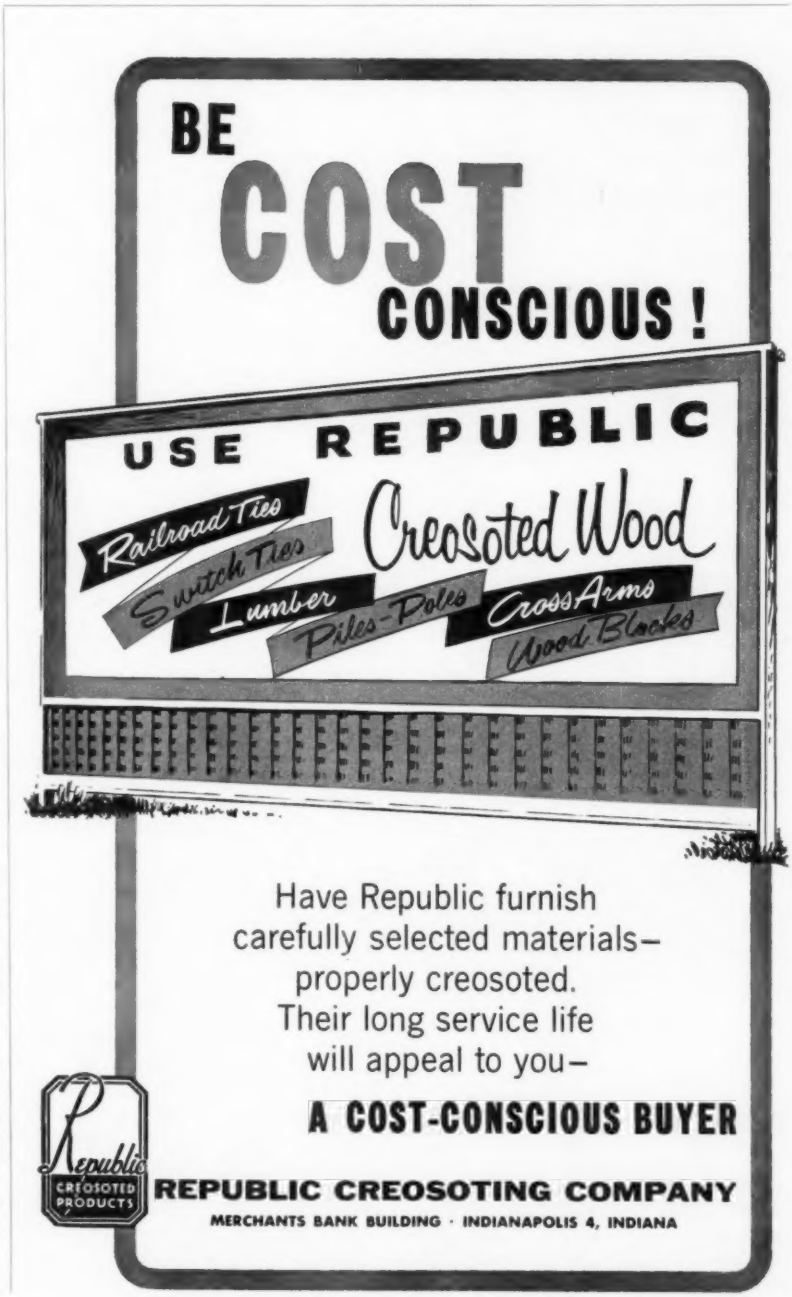
The board thereupon adopted the following resolution recommended by the committee:

"*RESOLVED*, That to the maximum extent possible operating telephone companies should own, provide and furnish to the Department of Defense the facilities needed to meet its communications requirements; and

RESOLVED FURTHER, That operating telephone companies having a military installation in their respective franchised or service area should have an opportunity to provide all of the facilities in such area needed to meet the communications requirements of such military installation; and

RESOLVED FURTHER, That all affected telephone companies should be encouraged to cooperate with each other in determining the method of providing the required facilities and should cooperate jointly with the Department of Defense in the attainment of the foregoing objectives."

This action was taken by our governing body in the interest of affording Independent telephone companies an opportunity to provide on an equitable basis facilities furnished jointly by Independent and Bell System companies to meet the communications needs of



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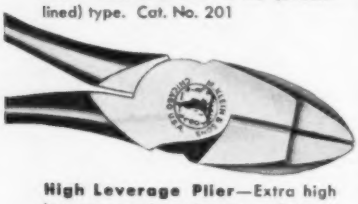

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the military at SAGE and Missile Squadron Sites in Independent territory. Our military Liaison Committee with the assistance of our association engineer, George C. Richert, has devoted much time and effort to these problems and continues to do so in a diligent attempt to implement the foregoing resolution.

It is hoped that these efforts will minimize any necessity for territorial invasion as well as the installation of government-owned communications systems contemplated by proposals submitted by various Independent manufacturers. . . .

Work of Settlements Committee

The broad area of toll compensation has been one of transcending importance.

The field of toll settlements has been a financially rewarding one over the years. During the last seven years several increases in settlements on business interchanged with Bell System companies have been successfully negotiated. In 1959 alone 12 million dollars was added to the total.

The aggregate amount of toll compensation received by Independent companies nationwide in 1959 exceeded 232 million dollars. This represented an increase of 30 million dollars over the comparable 1958 figure. Our Settlements Committee is confident that with continued effort additional benefits will accrue to Independent companies from toll settlements.

The executive committee of our association at its meeting in Chicago on Aug. 22-23 authorized the renewal of negotiations with Bell System representatives for upward adjustments in national average cents-per-message schedules. An initial meeting between our Settlements Committee and Bell System representatives was held on Sept. 27. Although it is too early at the time this report goes to the printer to speculate on the outcome we are hopeful the meeting and any subsequent ones will lead to recognition of the need for additional revenue from B-I settlements to reflect increased Independent company costs incurred in handling interchanged business with Bell System companies.

At the Aug. 22-23 meeting of the executive committee, authorization was granted to the officers of the association to seek the approval of the Federal Communications Commission, by a formal proceeding if necessary, of the use of the USITA separations manual to determine settlements for Bell-Independent interchanged interstate business. While we are hopeful that this formal step will not be necessary, we are determined to proceed with such a move if it is required.

Complaints seeking use of the USITA manual to determine settlements for Bell-Independent interchanged intrastate business have been filed by several Independent companies with state regulatory commissions, and litigation is at various stages of completion. The association is taking all necessary action to obtain regulatory approval of its manual. . . .

MARK-SENSE TOLL

Continued from page 53

reporting becomes late and inaccurate, and out collect messages are not forwarded promptly.

6. With a back-up in daily processing because of rejects, rating errors, large volumes, or machine breakdowns, month-end billing operations are late.

7. Perhaps the single most important area in mark-sense toll work in the accounting department, assuming correct rating, is in the control and scheduling of the work. Machine processing requires a series of progressive steps, which means that loose control and poor scheduling can create havoc and turn estimated savings into large losses. Adequate work schedules, assignment slips or routing slips and clearly labeled units of work in conjunction with good supervision is a necessity in this plan.

8. Manual toll work will not cease to exist. Even though the toll operation be mechanized, manual work is required to rate, review, accumulate reports, key punch, control, minute, and operate the machines. As an example: One General Telephone System company processes approximately 1,000,000 tolls monthly by the mark-sense plan. The miscellaneous manual work unit for this operation consists of 34 people.

III. Problems Solved by the Mark-Sense Toll Plan

A. *Industry Problems.*

1. The mark-sense plan has solved the problem of integrated operator and automatic originated toll ticket billing. This mechanical operation provides compatible input for mechanized accounts billing and permits complete automation for the handling of mass volumes within a single data processing center.

2. The mark-sense plan provides a means to standardize now on an industry basis the mechanized toll ticket which would have undoubtedly been required at some later time.

3. The mark-sense plan provides a mechanized file of rating records, accounting office address codes, and other useful data.

4. The mark-sense plan has also caused a general review of all accounting and traffic toll work. This

review will provide an opportunity to consider and revise out-of-date procedures and record-keeping.

B. *Company Problems.*

1. The mark-sense plan provides for a single neat statement of toll charges for both operator handled and automatic recorded messages.

2. The mechanized printing on a standard form using standard abbreviations is also an improvement over manual billing operations.

3. The mark-sense plan also permits the accumulation of statistics, rating and other non-technical work to be accomplished in the accounting department, which releases operating people to do the work for which they were trained.

4. More accurate rating will be provided by mechanical, rather than by the manual determination of toll charges.

5. Mechanized rating records will permit mechanical procedures to be employed for rate change work.

6. The plan also permits the mechanical accumulation of settlement and other statistical data, such as terminating point studies, to aid management in report and analysis work.

IV. Aids to the Problem Areas

A. *Administrative.*

1. The problem of non-standard mark-sense cards in size, interpreting and punching positions has been recognized. In this regard, effective Oct. 1, 1960, only the full-size standard collect mark-sense ticket will be mailed to the billing office. This card will be complete with the standard alpha-numerical control and explanatory punching. This plan will permit the billing office to utilize the full-size card or cut it to a standard size as required. Independent companies may arrange to receive the cut cards from their dispersing centers.

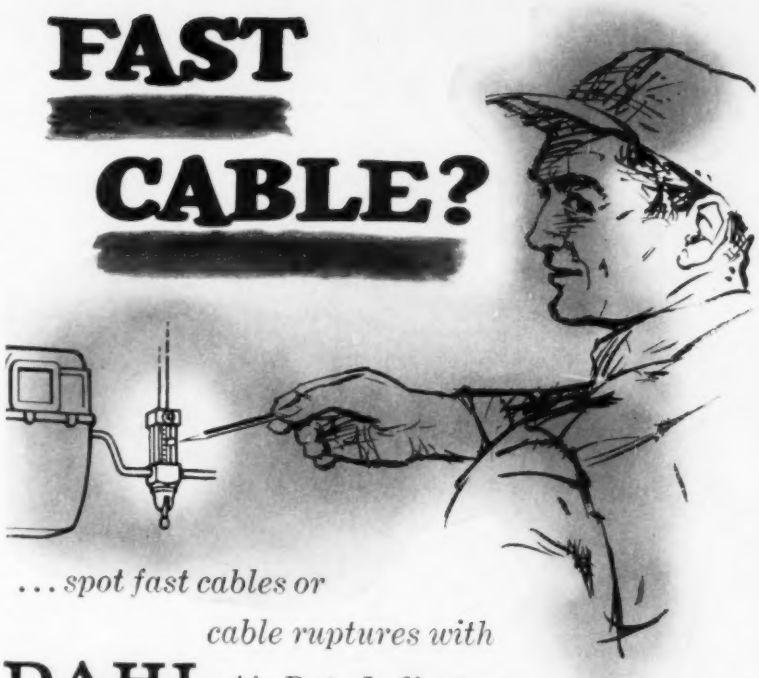
2. Information regarding the industry standard card design, punching and interpreting positions has been distributed through the USITA. It is to the advantage of the industry if all companies participating in the mark-sense plan adopt this card as rapidly as possible. All General System companies will use this card.

3. While the standardization of abbreviations of terminating points has not been a major problem, standard abbreviations can be obtained from the Terminating Point Master Card deck prepared by the Bell System. This deck is also useful in the initial preparation of the master rate card material.

4. Billing errors will be reduced as experience with the plan develops better control, schedules, supervision, and training plans. If a mark-sense conversion is planned, a visit to an operating center employing the plan will provide knowledge of management refinements in this area.

B. *Equipment.*

1. Recent equipment announcements such as the IBM 609 calculator will aid in the reduction of the required rating material and permit faster over-all processing.



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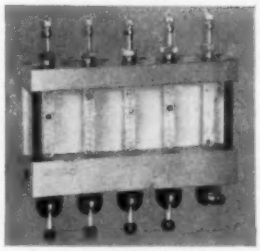

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The operating parts are the same as used on our No. 1-W Pulley Type Tree Trimmer, and are interchangeable.

This design retains the full strength of the pole at the point of greatest stress, and, for added ruggedness, we fit this tool with our Laminated Sitka Spruce poles.

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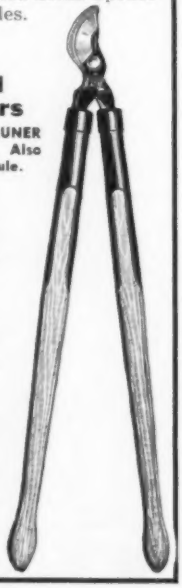

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2. Also, slower speed but lower priced equipment such as IBM Series 50 will bring mechanical toll processing within the reach of small installations.

V. Summary

In summary, the mark-sense toll plan is not a simple solution to toll problems, and does not have the same advantages or application in every company. The adoption of the plan will create new problems, but correct application can provide economic advantage. A decision as to the adoption of mechanized toll procedures is influenced by many factors, each of which is continually changing. The industry is generally moving in the direction of automatic equipment and complete mechanical or electronic accounting centers.

Considering these facts, the General System employs three techniques to keep pace with the changing situation. These are:

(1) The adoption of a complete mark-sense plan for a given company or only specific toll centers within a given company.

(2) The adoption of a partial mark-sense plan, i.e., accepting the full-size rated card from the connecting company that has converted to mechanized procedures and originates a punched toll card for the General company's business, and using the full-size toll card to print the toll statement of charges.

(3) The acceptance of a mark-sense card cut to ticket size from the dispersing accounting center, and the billing of this cut card in the manual procedure.

Another method worth consideration would be to request the connecting company that has converted to mechanized toll procedures and originates a punched toll card for your business, to prepare the toll statements and forward the cards and statements to you for bill enclosing and mailing.

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ACCOUNTING CHANGES

Continued from page 62

it would desire before adopting ELG, or for other reasons would prefer to continue to use present methods could do so without prejudice.

We have reviewed ELG with the FCC staff and with the NARUC committees on accounts and statistics and on depreciation. These groups are presently studying the idea.

These are a few of the accounting changes which have been accomplished in our field in recent years and others which are under active consideration. They all have one thing in common—a better and more economical accounting job. Certainly, we shall continue to be faced by new and challenging opportunities for improvement as we explore deeper into the many complexities of the present day accounting field.

NETWORK PLANNING

Continued from page 82

to point and the second is to tandem switch through an intermediate point or points. The determination of how it should be done for any particular network is the least expensive way consistent with meeting the objectives of service offered.

The very fact that there is an economic alternative between direct or tandem connections in network usage indicates the necessity for combining switching costs and facility costs into an over-all traffic plan in order to reach valid cost conclusions.

Traffic planning in recent years has taken advantage of switching flexibilities and improved transmission techniques to utilize the economies of high usage and alternate routing into the toll traffic plan in particular. These plans are based on cost ratios of facility and switching costs of the tandem connection versus the direct connection, in conjunction with offered traffic volumes, to determine the economic advisability of using direct (point-to-point) routing for particular segments of traffic. Network utilization for high usage and alternate routing is a subject within itself and I mention it here merely to indicate the importance of integration of all possibilities in network planning.

Industry Planning Necessary

In the Southern California area the networks of the Independents are so closely interwoven with those of the Bell System that a substantial degree of joint, or what might be called "industry" planning, is necessary, due to

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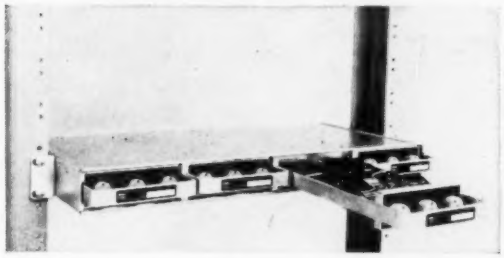

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the operation of several companies in the same metropolitan area. Phenomenal growth throughout the past 15 years, although at times posing some serious problems, has in reality been a "blessing in disguise" for it has permitted advantages to be taken of the latest technological advances in the art without generally displacing plant to do so.

During this period of time, new transmission and switching objectives have come into being and growth has led to a somewhat orderly transition to the new objectives. Today, some three types of message networks are used in the Los Angeles area and can be described as (a) the exchange and extended area service network, (b) the short-haul toll network and, (c) the toll network.

All of these networks utilize common underlying base facilities to the extent possible and transmission and signaling standards are attained by the utilization of carrier, voice repeaters, interoffice repeaters, or other facility additions. The exchange and extended area service and the short-haul toll networks employ the same objective transmission and switching standards, although there are ticketing functions and extensive use of high usage and final trunking in the short-haul toll network. "Via Net Loss" design of the toll network necessitates certain different considerations in this network, although circuits to Class 4 and Class 5 offices still may generally use the same base facilities as the other networks.

Flexibility Feature

In the Southern California networks, the availability of negative impedance repeaters has been a most remarkable tool. This class of repeaters has permitted real economies, in that basic designs have been able to use relatively fine-gauge facilities that are within signaling ranges and provide transmission loss control by repeater gains. Every advantage is also taken of the cable capacity expansion characteristics of carrier equipment especially for deferment of cable additions. The use of negative impedance repeaters and cable carriers in this complex network has permitted a great deal of flexibility in the arrangement and rearrangement of traffic trunk groups by virtue of the ease with which this equipment can be shifted from office to office as the planning demands.

Why is network planning necessary? The basic objectives of all network planning are to:

(1) Provide networks which are capable of meeting industry standards.
(2) Select alternatives with least cost throughout the study period.

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The importance of planning suggests a review of just what goes to make up network costs. There are two rules which might be considered fundamental relating to the economic study more familiarly known as the "economic selection study" and used for a selection of alternatives concerning the extension of telephone plant. These rules are:

(1) To convert all costs to a common base.
(2) Use a common time period for values involving the use of money.

Investment and Expense Same

Although we may commonly speak of investment and expense as separate elements, for the purpose of economic selection studies, they are in effect one and the same thing. Investment is nothing more than a deferred expense which will have to be paid out of operating expenses during the life span of the plant placed. This is, of course, so because of the element of depreciation which makes it necessary to charge a certain portion of the investment each year to operating expense in order to protect the integrity of the investor's capital.

To satisfy the condition of treating all costs on a common base, we generally use the term "annual charge." The "annual charge" should represent the total charges necessary each year in order to support the investment made. The common time period in connection with the use of money is necessary due to interest charges involved. Money to be spent today is not the same as money to be spent at some period in the future. Likewise, expenses for plant additions to be made at different times throughout a study period must be equated to a common time period in order to determine the proper relationship between alternatives which more than likely will incur different expenses at different times throughout the study period.

It is usually common practice to use compound interest tables to convert all charges throughout a study period to what is either called present or future worth. This merely ensures that total dollars expended during a time period will be relative one to another as far as the operation of the business is concerned.

Items of Cost

Cost elements to be considered in making up an "annual charge" must include all expenses incurred by virtue of the investment made. These expense charges include the following:

(1) Cost of capital, including an objective return on equity capital.
(2) Income tax.
(3) Depreciation.

NEW! LOW COST, RELIABLE, PRECISION, TRANSISTORIZED TRANSMISSION TEST EQUIPMENT from NORTHEAST ELECTRONICS CORPORATION

MODEL TTS 11 LEVEL MEASURING SET
- Measuring Range: +8 dbm to −30 dbm
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- Balanced transformer and step attenuator
- Switchable hold coil
- Terminals for TEL set
- Size: 7" *l* x 5" *w* x 5" *h*

Price $140.00

MODEL TTS 14 LEVEL METER
- A small, rugged, single range level meter
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MODEL TTS 15 TRANSMISSION TEST SET
- A compact set for measuring levels from +8 dbm to −30 dbm and to supply a 0 dbm signal at six frequencies.
- Input and Output Impedances: 600 and 900 ohms
- Simultaneous Send and Receive
- Switchable hold coil
- Terminals for TEL set
- Size: 7" *l* x 5" *w* x 6¼" *h*

Price $225.00

The above are additions to a wide line of telephone test equipment including the well known high precision, transistorized Model TTS 4A Transmission Test Set and Model TTS 9S Frequency Cycling Reference Generator, and many others. Write for complete catalogue.

An Extensive Line of Telephone Test Equipment available from —

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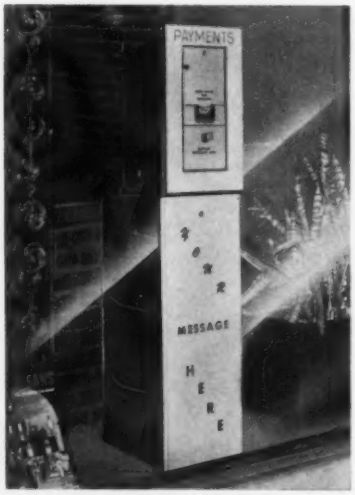

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(4) Maintenance.
(5) Other distributed operating expenses.

The cost of capital will be determined by the equity-debt ratio of the capital structure of the company and the objective earnings to be provided to owners for the use of their capital. There is no question about income tax as being an expense to the company. Depreciation is extremely important as this charge is necessary in order to protect the integrity of the owner's investment. I suggest we be as realistic as possible in the use of depreciation factors in economic selection studies and give due consideration to the factors of obsolescence in the classification of plant being considered.

Obsolescence Important

As we are in an age of what you might call rapid technological advances, especially in the fields of electronic apparatus, obsolescence can be extremely important. For instance, today there are many cases, in fact sometimes you would think it is almost universal, where equipment improvements are being made by the employment of transistors in lieu of vacuum tubes. It is not difficult to see that equipment improvements of this nature will certainly tend to advance the day when existing vacuum tube apparatus will necessitate replacement in order to take advantage of improvements made since the time that the vacuum tube apparatus was placed in service.

An evaluation of the depreciation situation will result in the "annual charge" depreciation factor being realistic to this end. The item of maintenance also may become quite important especially when speaking of the electronic or more sophisticated apparatus. There is sometimes a general tendency to look at maintenance from a historical standpoint based on certain classifications of plant which may or may not result in the proper maintenance factors being used as a part of the "annual charges." In this regard, all that is necessary is some flexibility in study development to recognize and reflect the conditions expected as nearly as can be estimated. The other distributed expenses should merely show general overhead or administrative charges attributable to the use of the type of plant being studied.

Networks Must Be Planned

By generalizations, I have attempted to touch on several aspects of communications network planning. It is important that networks be "planned" rather than permitted to just "grow." If I have been able to leave you with the impression that:

(1) We are in the communications rather than in the telephone business.

(2) We must place ourselves in as good a competitive position as possible by giving the customer the quality of service that he demands.

(3) There is a continuing job ahead of us in meeting today's objective standards for switching and transmission and even a greater challenge in preparing for the future, especially in the realm of transmission.

(4) Electronic apparatus made it possible to economically attain our network position today and will be more effective toward this end in the future.

(5) Any network problem should be resolved to the basic and pertinent economic considerations involved.

(6) Network planning should include all elements which may have an effect on the economies thereof throughout the planning period.

Then, you have received the message I had to convey.

In closing, I would like to reiterate a point made earlier about our future business possibly consisting predominantly of "machine" rather than "people" talk. As communications companies, it is of extreme importance that each of us provide the networks capable of handling data and see to it that these networks are, in fact, used for that purpose.

Long Distance Circuits Via Radio Added by Carolina T&T

A microwave radio system to provide additional long distance circuits in the Rocky Mount-Williamston area is being completed by Carolina Telephone & Telegraph Co., Tarboro, N. C.

Initially the system will provide circuits for 24 simultaneous conversations. It is designed, however, so that it can be expanded to carry 240 circuits.

Two towers, one at Williamston and one near Tarboro, have been constructed by the company. The tower at Williamston is 125 feet high and is located behind the telephone building. A 280-foot tower has been erected adjacent to Mayo School near Tarboro. This tower will serve to boost the radio signal between Rocky Mount and Williamston.

At Rocky Mount the company will utilize an existing tower which is part of its Rocky Mount-Fayetteville microwave system. All of these towers are constructed to withstand hurricane force winds.

Work on the towers has been finished and installation of associated equipment is nearing completion. It is anticipated that the system will be placed in service about Nov. 1.

The new system, including all necessary central office equipment, towers and buildings, will cost about $195,000.

THINGS TO COME

Continued from page 86

the United States. We need only look at the record to know that private enterprise has given this country the finest, the most complete, the most dependable communication system in the world. We strongly believe that private enterprise will also keep this country out in front in space communications, just as we have led the way on land and by sea. It was private industry that pioneered world-wide telephony, first by radio and later through cables. We want and intend to be pioneers tomorrow, too. We are ready, willing and able to push ahead. All we need is the leeway, the freedom, to do our best.

Another basic question is the availability of frequencies for satellite systems. The radio frequency spectrum is, of course, a natural resource, and the frequencies that can be used for satellite communications are limited. The best area is from roughly 1,000 to 10,000 megacycles, with some possibility also of using the range from 10,000 to 20,000. In the extremely high frequency range, rain blocks off transmission. Below 1,000 megacycles sky noise increases, and besides, big bundles of frequencies are already in use.

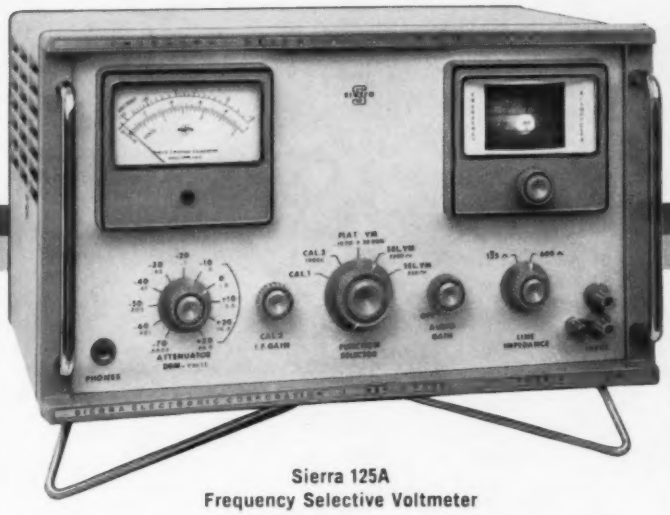
Every satellite communication system will consume, over a wide geographical area, and across national boundaries, a large number of the frequencies. It is true that by careful assignment to different sets of frequencies, we can expect different systems in various parts of the world to function successfully using the same satellites. Nevertheless, there is a definite limit to the possibilities, and the saturation point will be reached most quickly in those areas where the volume of communications is heaviest—as for example between North America and Europe.

Obviously, satellite communication systems must not interfere with each other, and matters must also be arranged so that other uses of microwave radio—uses that have nothing to do with satellites—will not interfere with and overpower the faint signals from space. To define the uses of frequencies in various regions, we shall need the most thoughtfully considered international agreements.

Also, since the number of frequencies is limited, this will test the wisdom and foresight of each nation right now in charting domestic policies.

In the United States, for example, there are at present no frequencies specified for space use in the frequency range most suitable for satellite communications—that is, the range above 890 megacycles. In fact, all the frequencies in the range we need for satel-

New Tunable Voltmeter is also flat AC VTVM covering 1 to 620 KC



Sierra 125A
Frequency Selective Voltmeter

As a frequency selective voltmeter, Sierra 125A covers 3 to 620 KC continuously on a 40" scale. An up-converter with high IF and single conversion keeps spurious responses down 60 db. Crystal lattices provide two steep-skirted IF bandwidths — 250 cps or 2.5 KC.

As an AC VTVM, Model 125A offers response flat within ± 0.2 db, 1 KC to 620 KC, and measurement accuracy of better than ± 0.5 db. This additional mode increases the instrument's versatility and facilitates measurements on carrier systems.

Measurement range is —90 to +32 dbm in selective mode and —30 to +32 dbm in the flat mode. Signal levels are read directly on either 135 or 600 ohm lines, balanced or unbalanced. Line bridging loss is less than 0.25 db over the entire frequency range. Built-in 100 KC crystal oscillator provides accurate reference for both level and frequency calibration. Modular construction and etched epoxy glass circuit boards provide ease of access and operating dependability.

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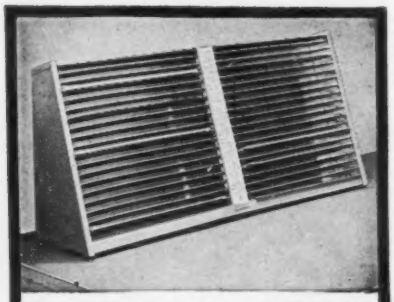


Trouble Recorder Card Rack

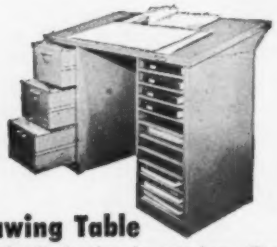
For fast orderly sorting of Trouble-Recorder cards, has 38 card slots in two banks with index strip between. Base is 38" by 8". Height 15". No. D-30325-1

Telephone Office Equipment

to lighten your work and improve efficiency

Work Bench

For repair, assembly, test and paper work. Top drawer divided into 24 compartments for parts and tools. Large file drawers are for circuit drawings. 54" x 25" top covered with masonite. Height 36". Drawers may be inserted from back to reverse position of kneehole. No. D29978-3.



Drawing Table

For circuit drawing in crossbar offices, provides central location for reference material. Masonite top is 30" x 60". Height 36" at front, 42" at rear. Three large file drawers at left for drawings. Eleven shelves at right are 2½" high, 14" wide, 18" deep for sketches, sequence charts, book type SD sheets, trunk serials, etc. No. D30326-1.

Color of all units: Baked-on gray enamel unless otherwise specified.

TWIN POST

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lite systems, are already allocated to other uses.

And, on Sept. 29, the Federal Communications Commission substantially reaffirmed the microwave licensing policy outlined in its order of Aug. 6, 1959. This is the case which is referred to as "above 890." Briefly, the FCC order opened the way for almost unrestricted licensing of all business for private microwave in that segment of the radio spectrum above 890 megacycles. The commission suspended this order last October and in May reopened the record of the case to new testimony regarding frequency needs for space communications.

We believe that this most recent action on the part of the commission may well pose grave problems for space communications in the future. In fact in a recent public statement we said, ". . . the commission has disregarded the urgency of safeguarding the radio spectrum for space communications. It also ignores the fact that the wide open licensing of private microwave systems will ultimately cause a financial burden to fall on general users of telephone service."

(At this point, Mr. Stevens presented a movie, "The Big Bounce," depicting development of satellite communications.)

This concludes my presentation. The Bell Telephone Laboratories is continuing the research program in satellite communications. This includes work on an active satellite, i.e., one which functions as a relay station not merely a reflector. This could well be the forerunner of the system we will need for the world-wide satellite communication plan which was referred to in the movie.

I understand copies of "The Big Bounce" are available in all the Bell operating companies. If any of you would like to have the film for showing to your employes or customer groups I suggest you get in touch with the Bell Independent company relations folks.

Thanks for asking me to come to your 1960 convention and to speak to the Engineering Conference. As you know, in my present assignment I have had many contacts over the last several years with the Engineering Committee and the DDD subcommittee. From my viewpoint this activity has always been pleasant and rewarding.

The Ninth Wonder

"The American economy is the eighth wonder of the world; the ninth wonder is the economic ignorance of the American people." — G. KEITH FUNSTON, *president of the New York Stock Exchange.*

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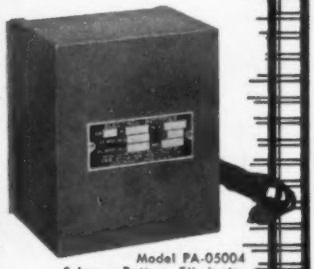
SCHAUER is recognized by the Telephone Industry throughout the world as a leading manufacturer of battery eliminators and battery chargers for almost every DC power requirement. You save with Schauer—on low first cost, low operating cost, and reliable service. See your Jobber or write for Bulletin No. 1470.



Model PA-05004
Schauer Battery Eliminator

Here's a sure SCHAUER power source for the operator's circuit on magneto switchboards

Schauer Type PA-05004 Battery Eliminator delivers constant, hum-free direct current to the operator's circuit. Equipped with relay for automatically transferring power to stand-by dry cells in the event of AC failure. Standard capacity is 4 volts DC at 0.5 amps. Steel case, for wall mounting is 5½"x6¼"x4".

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SCHAUER

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TRUNK CARRIER

Continued from page 104

tive and aggressive forms of competition. We urge that this challenge be met head-on.

The system should also be able to compensate automatically for the effects of the anticipated daily and seasonal cable temperature variations. At 400 KC, the loss of 22 gauge 0.082 MF/MI cable changes by about ±1 db/mile for a temperature variation of ±50°F, from the loss at 55°F. Regulating repeaters would be necessary as often as loss variations, based on temperature extremes anticipated for the particular cable, equaled the limits for the system being used.

We have now derived (at least for AM systems) a potential requirement for three types of repeaters—one with a "higher-level" capability, one with "regulating" capability, and one "plain" repeater. All three types would have flat gain and slope-correcting capabilities.

Consideration should be given to providing at least one standby carrier line in each direction of transmission, equipped with repeaters and prealigned. In addition, a carrier frequency Patch Panel, equipped with an order wire, should be considered. This would allow bypassing line or repeater failure by patching the terminals of the affected system to the standby line at both ends, thereby restoring service quickly and allowing an orderly approach to locating and correcting the trouble.

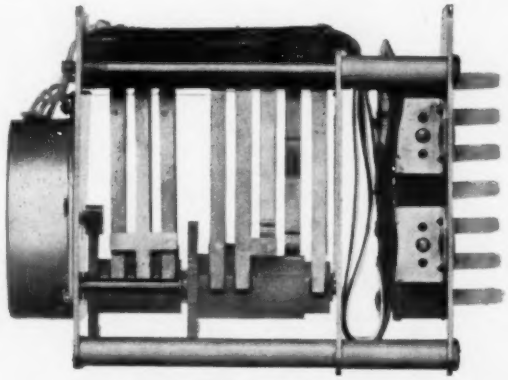
Today's standard maintenance objectives require that net loss be maintained within ± 1 db of the assigned value. The systems we buy from now on should be capable of meeting this requirement, and our engineering layouts should be sufficiently within a system's design limits that the objective is met. End-to-end automatic regulation is required in AM systems, and adequate signal-to-noise ratios are required in FM-type systems.

Exchange trunk carrier systems are expected to have adequate channel noise levels without the use of compandors or equivalent devices. Message noise objectives probably are not changing much, but the methods of describing and measuring message noise levels is being changed at this time.[7, 8, 9]

In the meantime, the message noise-objective for all trunks (except intertoll) is given as: maximum 26 dba with FIA weighting, when measuring on the trunk from the subscriber side of the local central office switches, is equivalent to zero "Noise Transmission Impairment" (higher values would im-

The A. W. Haydon Co. designed this series of repeat cycle timers for engineers with tricky timing problems and tight budgets. The low unit price on quantity runs will surprise you...and the savings we can offer on very large volume production sometimes surprises us! ■ Yet there has been no sacrifice in quality...it's all in the design. Special spring switches are supported in molded contact blocks; cams, cam followers and gears are molded nylon for long service life and extremely quiet operation. Two printed circuit cables supply internal wiring to 12 output circuits, and parallel cam shafts provide two cycling speeds. ■ The A. W. Haydon Co. has designed this repeat cycle timer to operate continuously for at least one year, but it will actually run for much longer. ■ The unit shown operates at 115V, 60 CPS, 2.5 watts power input. Its switch has been tested for 2 years (125 million cycles at 2 amps resistive 10VAC, 60 CPS) and is rated for 2.5 amp or a 7.0 amp inrush lamp load. ■ To be sure, other variations are available. A. W. Haydon will be delighted to quote these long life, low cost repeat cycle timers in any one of 125 standard speeds, 5 voltage ratings and 3 power supplies. All have Jones type terminal plugs for fast installation, and a quick-change motor mounting for ease of motor replacement. A clear plastic dust cover helps reduce noise level to a whisper. Write for information on your particular requirement.

LONG LIFE LOW COST REPEAT CYCLE TIMERS



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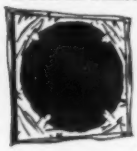
Keep a supply on every line truck as standard equipment, or write for details on how we can install them for you: OSMOSE Wood Preserving Co. of America, Inc., 976 Ellicott St., Buffalo 9, N.Y.



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pair transmission-35 dba, for example, is equivalent to adding 4 db of direct loss to the trunk).

For dial circuits, it is desirable that the system be equipped for automatic disconnect and make busy, when a channel group or the system fails. It is not considered necessary to protect against individual channel failure. Most dial offices are arranged so that successive attempts seldom land on the same trunk, even during light traffic load periods.

Channel drop impedance and network impedance should correspond to standard "office impedances." For all trunks terminating in Class 5 (local) offices, or in tandem offices, 900 ohm drop and 900 ohm plus 2 MF compromise network impedances should be specified.

At the toll office (Class 1, 2, 3, or 4) end of all toll connecting trunks, 600 ohm drop and 600 ohm plus 2 MF compromise network impedances, and an adjustable NBO capacitor should be specified. If the drop-to-network carrier hybrid impedance ratio is not unity, the resistance component of the compromise networks is adjusted accordingly.

For example, for a drop-to-net ratio of 1-1.5, the required resistance would be 1.5/1 times the standard or normal value; the normal value of NBO is adjusted in the opposite direction, and in this example would be 1/1.5 times normal.

Initially, the objectives for Terminal Balance[2] (at offices where intertoll and toll connecting trunks are switched together) required NBO capacitors only on intertoll trunks. They were based only on echo return loss seen from the intertoll side of the switches.

Poor return loss to the toll connecting side of the switches was "laughed-off" as extra but relatively harmless sidetone. This poor return loss is poorest at the high end—the 3 KC region—of the voice frequency band.

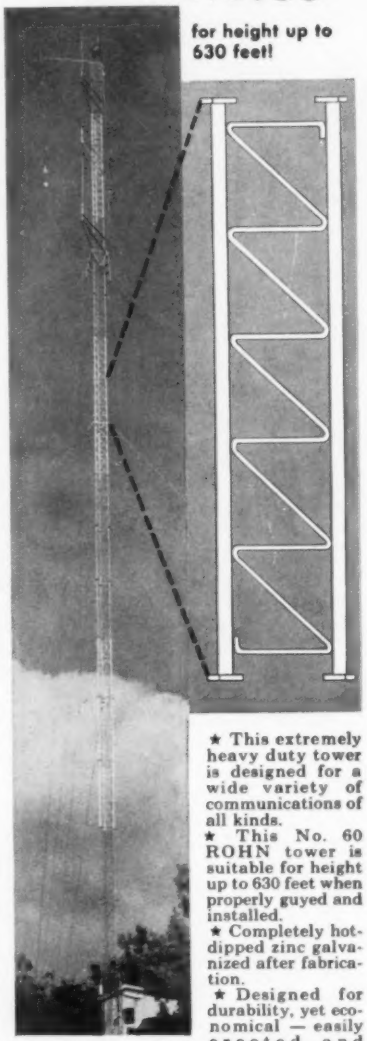
But times have already changed: hands-free phones, dialed-up TWX, and dialed-up Dataphone services have been added. Some of these services operate at the upper frequencies, and better return loss is needed for circuit stability.

By also placing the same value of NBO capacitance across the compromise network of all toll connecting trunks which have 4-wire terminating sets, we improve "stability" return loss of these trunks from about 7 to 8 db at 3 KC to the order of 20-25 db at 3 KC.

Therefore, terminal balance rules for the application of NBO capacitors are being changed to extend their use to toll connecting trunks—when the toll office requires NBO, it is to be provided

ROHN COMMUNICATION TOWER *No. 60*

for height up to 630 feet!



Shown here is a ROHN No. 60 tower installed to a height of 200 feet with 3 five-foot side arms, mounting antenna for police radio communications.

★ This extremely heavy duty tower is designed for a wide variety of communications of all kinds.

★ This No. 60 ROHN tower is suitable for height up to 630 feet when properly guyed and installed.

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★ Designed for durability, yet economical — easily erected and shipped. ROHN towers have excellent workmanship, construction and design. Each section is 10 feet in length.

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on *all* trunks having 4-wire terminating sets.

If the proper options are available in the system being used, considerable additional economy may be realized in use of the carrier for one-way trunk groups. In such cases, the usual repeat coil and trunk circuit can be eliminated entirely.

In the past, these have been omitted at the incoming end of voice-frequency derived trunks, which often resulted in excessive noise and inductive interference; but carrier-derived trunks are not directly susceptible to such trouble.

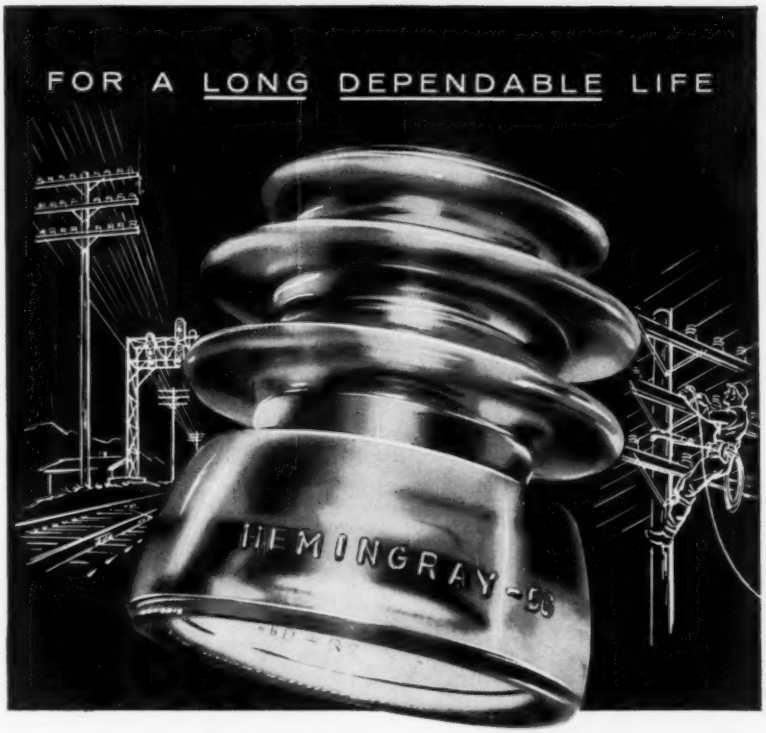
The channel is equipped at each end with loop signaling (1,200 ohm range balanced battery feed at out-going end), the proper drop and compromise network impedances, and NBO capacitor (if required). Then the channel is connected directly to selector bank terminals at the outgoing end, and directly to incoming selector jack terminals at the incoming end. The interconnected leads may consist (for example) of T, R, C, EC, and ATB (for traffic metering or alternate routing indication to SATT Directors); or equivalent.

For two-way trunks, trunk circuits should be used at both ends and should be equipped for E&M signaling. The channel is to be equipped at each end for proper drop and compromise network impedances, and NBO, as required. The channel drop is then connected to the trunk circuit at each end, using T, R, C, A, B, E, M leads; or equivalent, as required.

The carrier channel should provide A and B leads with adequate current-carrying capacity, and proper impedances, so that the usual repeat coil may be omitted. Proper total shunt capacitance should be provided across the A&B leads; if provided in both the carrier equipment and associated trunk circuit, it should be disconnected in one of them.

Equipment savings are also possible in those systems offering central office end and subscriber end built-in "dial long line" signaling for applications such as foreign exchange (FX) service.

When it is necessary to extend a carrier channel with fixed voice frequency facilities, special attention should be given to providing adequate network balancing of the equipment and facilities on the drop side of the carrier's 4-wire terminating set. A repeat coil, carrier filter, series-type composite set, etc., require balancing in the network. Voice frequency facilities require precision network in place of compromise network; except that loaded cable pairs properly equipped with impedance compensators are balanced adequately by the 900 ohm plus 2 MF compromise



NUMBER 56 - *Double-Groove Transposition. These insulators are employed for all circuits (exchange, toll or trunk) that employ tandem-type transpositions.*

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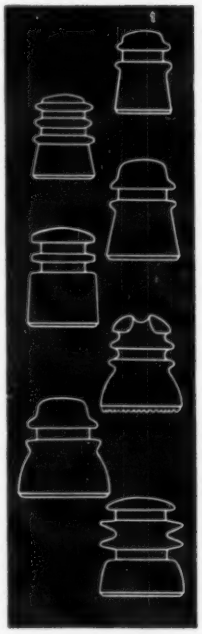

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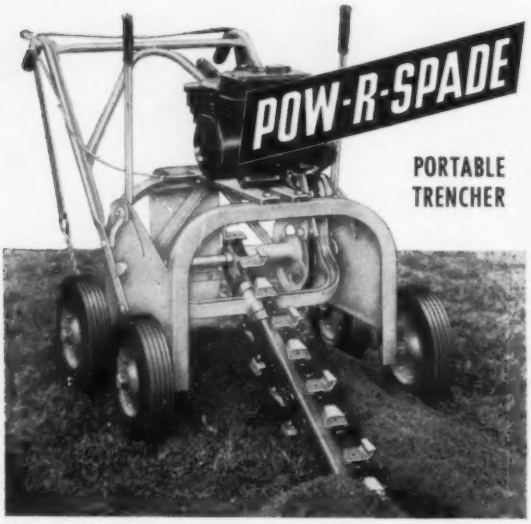

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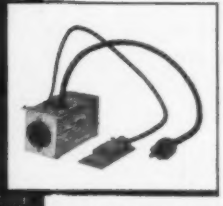

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network. In most cases, it should be possible to avoid special network balancing apparatus by using loop or FX signaling options.

The E&M signaling could be extended also (without adding drop equipment which would require balancing) by using "E & M Extension" (DX 2) signaling, connected through the A and B leads of the carrier drop's 4-wire terminating set. DX signaling requires 4 MF shunt capacitance across A&B leads—it will probably be necessary to add to the capacitance normally provided by the carrier equipment.

The engineer should work out his channel extension problem within the limitations of the system being used; namely, the wiring and other options that are available for it.

When noise, picked up by external taps on non-carrier pairs, causes trouble, inductors for carrier frequency longitudinal noise suppression might be needed. These are currently used on layouts for K, N, and BN type carrier systems. But we suggest that for exchange trunk carrier this item should be omitted initially, and used only when necessary.

A typical loading and carrier system layout is illustrated in *Fig. 1.*

Installation

As little as one man-day will be required to install and cable one terminal of one system. Man-hours per repeater housing should be about equivalent to installing and splicing-in a cable terminal with a 50-pair stub. The usual repeater housing is equipped with two 16-pair cable stubs.

Repeater housings on aerial cable should be mounted on poles, or on a cross-arm arrangement when several housings are required at each location. The design of the housings should include suitable control of temperature, within the design limits of the repeaters. The housings should be placed about 8 feet above ground. Permanent work platforms should not be provided; the Baker Board (portable pole platform) or other suitable portable device should be used for access.

The same repeater housing should also be usable in manholes for underground cable, and on pedestals or stub poles for buried cable.

Repeater housings should be equipped with gas fittings and be able to withstand 15 pounds gas or dry air pressure. The cable stubs should contain gas dams to prevent loss of main cable pressure when the housing cover is removed. The housings could then be purged and pressurized from a portable tank, or a by-pass tube equipped with shutoff valve could be connected

from the main cable. Before opening the housings, it would be necessary to close the shutoff valve and to relieve the pressure (at a second fitting) in the housing.

The cable stubs, equipped with gas dams, usually come two per repeater. To provide uniformity and to reduce confusion, all stubs should be spliced in the same manner. We suggest facing the front of each repeater housing, then splicing all left-hand stubs to the pairs from the direction of office "A"; and all right-hand stubs to the same pairs (after they are cut), but toward office "B." Be consistent, and do it this way, even when the housings are on the side of the pole that requires a cross-over of stubs.

The 20 KC completion test (described earlier) should be made after the splicing is completed.

Figs. 2 through 5 illustrate typical terminal and repeater housing installations.

Lineup

The system and channels are lined up in accordance with the manufacturer's instructions; except for voice frequency drop level (net loss), which is set in each direction in accordance with the circuit layout card (or engineering instructions). The manufacturer's special test equipment should be used—in some cases it must be used.

Additional standard circuit order tests may also be required, depending on the class of trunk and company practices. These could include noise, singing point, echo return loss, open circuit stable, short circuit stable, and a test call.

If the channel is assigned as a toll connecting trunk, an NBO capacitor is required at the toll office end. It must be strapped to the value specified for the office; this value is usually given on the circuit layout card. When the carrier hybrid drop-to-net impedance ratio is not unity, the central office man must adjust the nominal value of NBO (per our earlier discussion); but first, he must be sure whether the card value needs such adjustment or is already properly adjusted. NBO capacitors are *not* to be adjusted on an individual test basis.

Signaling is also adjusted and tested, using a standard signaling test set, as required.

Maintenance

Trouble location, as mentioned under engineering, is very simple if the spare carrier line, spare repeaters, carrier line patching jacks, and order wire are provided. It consists mainly of out-of-service testing, and correction by substitution, in both terminals and repeaters.

Routine maintenance should include the tests recommended by the manufacturer, plus over-all noise and net loss (in both directions). The time interval between these routine tests would be dictated by company practice.

Conclusion

The big breakthrough to cheaper and better means of providing up to 50 per cent of our trunks has been accomplished. All three developments (K24, X, and 81A) seem to have met the general cost and transmission requirements and merit the classification "exchange trunk carrier." Each has an option or a slight technical advantage or two that the other does not. These developments are very new to us and to the manufacturers; but, after the initial shakedown period, they seem to be performing satisfactorily. If not all, certainly enough of the problems have been solved to make it a safe bet that exchange trunk carrier is here to stay.

References:

1. "The Present and Future of Tele-

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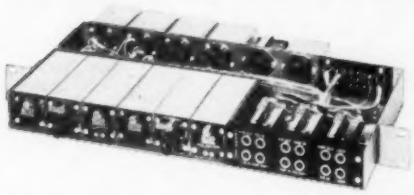

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LINE CONCENTRATORS

Continued from page 110

able to provide the type of service that was desired; many upgrades could be accomplished.

A 15-pair terminal in the center of the area was chosen as the location for the new unit, which was a nine-trunk, 49-line concentrator. Eleven pairs were required for its operation, leaving four pairs for direct service. Three of these were used for the PBX trunks to the hospital and the fourth for a high usage four-party line in the area. Two 18-pair aerial urban distribution cables were extended from the unit one block north and one block south, which were further on distributed out east and west by 11-pair urban distribution cables. Eleven pairs were terminated in a new can at the concentrator. You can see that of the 49 derived pairs, 47 are now directly available through the area.

This entire project was done for $5,400. A 50-pair cable into the area was figured at approximately $9,400. And the whole construction project was done by four men in three days.

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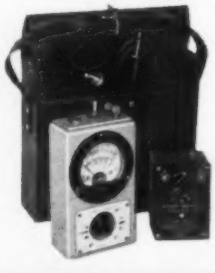
Model JK



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Up to this time I have not mentioned the maintenance problems and really they are hardly worth mentioning. The 12-trunk unit has had two cases of trouble that were both cleared in less than 30 minutes, neither of which affected service to more than one line. The nine-trunk unit has also had two faults involving relay adjustment, which were readily cleared. Each unit is checked for proper trunk rotation once a week from the central office end. This inspection involves about 10 minutes for both units. Since no faults have been discovered by these inspections, we are considering changing them to monthly inspections.

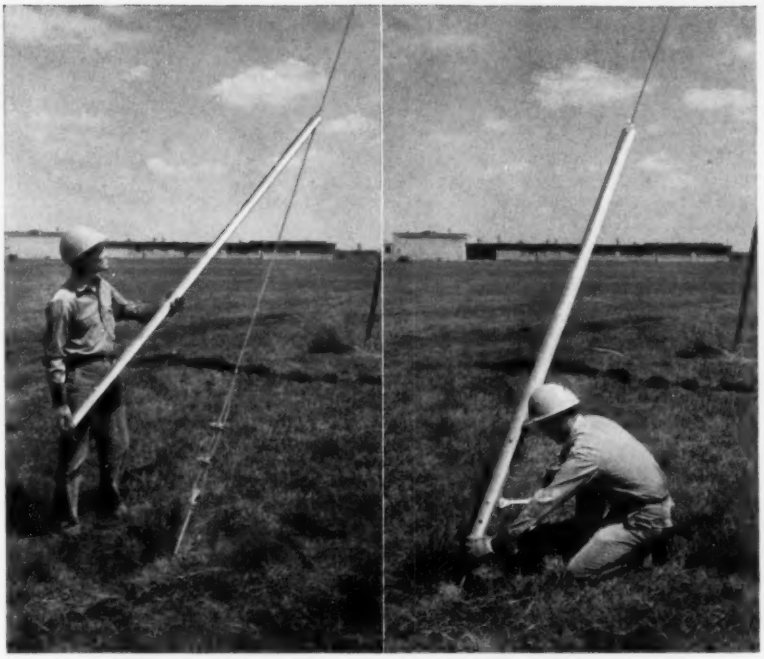
By describing these two situations, I don't mean to imply that line concentrators are the answer to all cable problems. Generally speaking, large housing developments in new areas where no cable facilities exist lend themselves better to cable installations, especially if large numbers of pairs are involved.

Concentrators, in their present stage of development are not designed to replace small satellite offices, although work is underway to make this a reality. It is interesting to note that at least one manufacturer has under development a unit that will operate in conjunction with carrier equipment so that it may be operated in rural areas over two copper pairs. Other development is going on to make the concentrator establish connection within itself so that pairs are not used during the conversation, but only during the time that the call is being dialed and rung. It has even been hinted that central offices of the future may become merely a common supervisory machine that will control the action of many concentrators situated throughout a large city.

All of this effort is directed toward one goal, and that is to make our plant facilities more efficient so as to be able to render better service and to constantly attack the problem of ever increasing costs.

Within the time allowed for the presentation of this paper it is not possible to cover all of the ramifications of line concentrator operations. In the Aug. 27 issue of TELEPHONY is an excellent article entitled simply "Line Concentrators" by Frank E. Lee. Reprints of this article are available here today and I strongly suggest that you pick up a copy as it covers thoroughly the many questions you may still have in your mind.

During this presentation you will note I have avoided any concrete references to costs and revenues, because labor costs vary from company to com-



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For complete details on all Chance Pole Line Hardware, refer to the Chance Catalog and Pole Line Hardware Cross Reference Guide.

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pany. Your situations vary widely, such as the distance you might have to go from the central office. Rates for service also vary from company to company hence it is difficult to say from this speaker's stand that you should or should not install a line concentrator. Every situation is different, but it should be explored. If I have only made you conscious of the fact that line concentrators exist and do a job, I have accomplished my purpose.

REA Announces Telephone Loan Authorizations

THE Rural Electrification Administration has approved telephone loans as follows:

Dunbarton (N. H.) Telephone Co.; $144,000; Oct. 3.

Proceeds will help to improve service for 197 subscribers and to furnish initial service for 49 subscribers. This new borrower of REA funds now furnishes magneto service to the existing subscribers. New construction planned to serve the modernized system includes a dial central office at Dunbarton.

Mrs. Helen W. Montgomery is president of the Dunbarton company and Donald Montgomery is manager.

•

Prescott (Wash.) Telephone & Telegraph Co.; $271,000; Oct. 3.

Loan funds will aid in improving service for 408 subscribers and in furnishing initial service to 210 subscribers. The existing subscribers now receive common battery and magneto service through the Cascade Telephone Co., Roslyn, which this new borrower proposes to acquire, rehabilitate and expand. These facilities include the Roslyn central office.

In order to improve service in the expanded area, the company plans to construct a new headquarters-dial central office building in Roslyn. The borrower now furnishes adequate dial service to 147 subscribers through its Prescott central office. None of this loan will be spent in the Prescott area. However, headquarters for the Prescott company will be moved to Roslyn as soon as the new building is completed, because existing facilities at Prescott are inadequate.

Harold W. Weis is both president and manager of the Prescott company.

•

Citizens Telephone Co., Brevard, N. C.; $831,000; Oct. 6.

This loan will assist in furnishing initial service for 1,114 subscribers, constructing a dial central office-headquarters building in Brevard and in providing for an increase in the proportion of private and semi-private lines. Facilities required to serve the additional subscribers will include new and larger dial facilities in the Brevard building. REA loans to this borrower will help it to bring new and improved service to 3,418 subscribers. The system will consist of dial exchanges at Brevard and Rosman. Both exchanges are in operation.

•

Notasulga (Ala.) Telephone Co., Inc.; $310,000; Oct. 7.

Proceeds will aid in providing initial service to 300 subscribers and in improving service for 371 existing subscribers. This new borrower now furnishes common battery and magneto service to the existing subscribers. The company plans to construct a new commercial-dial central office building in Notasulga.

Joseph W. Parker is both president and manager of the Notasulga company.

•

Egyptian Telephone Cooperative Association, Steeleville, Ill.; $56,000; Oct. 7.

These and funds from a prior loan will assist this borrower to improve service for 115 subscribers and to furnish initial service to 109 subscribers. As a nucleus for the expanded system the borrower proposes to acquire the St. Libory Telephone Co. which now provides magneto service to the existing subscribers and replace the St. Libory exchange facilities with a new dial central office.

REA loans to this borrower will benefit 1,628 subscribers. The system will consist of seven exchanges of which six now furnish dial service to approximately 1,125 subscribers.

•

Peoples Telephone Cooperative, Inc., Quitman, Tex.; $426,000; Oct. 7.

This loan will help to finance construction to extend service to 436 new subscribers. The loan provides for the construction of new dial central offices at Dry Creek and Sandy Creek to serve 186 of the new subscribers. The addi-

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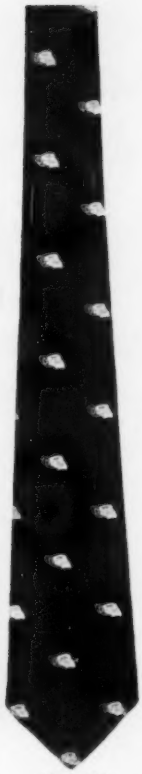

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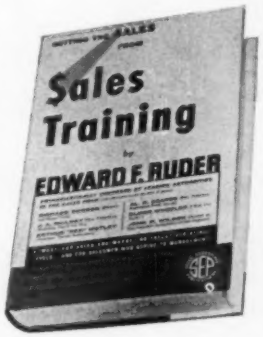

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tional 250 subscribers will be served through existing dial exchanges at Wynne, Golden, Jim Hogg, Yantis and Glade Branch. Funds also are included in the loan to assist in financing the construction of a new headquarters building in Quitman.

Upon completion of the facilities provided for with the aid of this and prior REA loans, the borrower will be operating seven dial exchanges serving 1,569 subscribers. The five exchanges now in operation are providing dial service to approximately 1,029 of the subscribers.

Individual Political Effort Great Need, Says Motley

Every American should learn from the Communists of the great power that can be wielded by small, organized groups of dedicated men, Arthur H. Motley, president of the Chamber of Commerce of the United States and publisher of *Parade* magazine, said in New Orleans on Oct. 3. Mr. Motley is well known to the telephone industry as he has addressed conventions of the United States Independent Telephone Association.

He was speaking before some 2,000 persons attending the annual meeting of the National Defense Transportation Association (NDTA). This organization has nearly 14,000 members across the country who are engaged in every phase of the transportation industry. The NDTA works to maintain the industry at a high level of efficiency and preparedness in the event of a military emergency; seeks to assure the fullest coordination of the various modes of transportation; and to aid in planning utilization of transportation in war or emergency.

"It's as true in modern society, as it has been throughout history, that big causes are won by a few persons willing to get out and work, to run risks and to make sacrifices for what they believe to be right," Mr. Motley told his audience.

He referred to the achievements of the 12 Apostles, the 56 signers of the Declaration of Independence, and "the few hundred organized English barons who handed down the Magna Carta."

In his address, Mr. Motley emphasized the need for more persons in all walks of life to team up for precinct work in the political parties of their choice.

"Political apathy is so widespread that one smart, active individual can get things done in either party, and a few of them, working together, can swing elections," Mr. Motley said.

This apathy, he indicated, constitutes one of the great problems of our times and provides an equally great opportunity for today's Americans to work for a cause—that of better government.

"Government is the product of politics. Participation in politics by more and better people leads directly to better government. Our political parties need more of the same kind of zealous effort that brought on some of the great achievements of the past," Mr. Motley said.

"The Communists know how it's done," he added. "Look at the havoc that tightly-knit little cliques of them have been able to cause at times in our own industrial society. Look at the way a handful of Communists turned thousands of our university students into rioting demonstrators in San Francisco a few weeks ago to embarrass the House Un-American Activities Committee.

"These Communists get things done because they're trained, and because they're willing to go out and work for their evil ends."

Training is readily available to anyone who wants to work effectively for better government, Mr. Motley continued, calling attention to the National Chamber's action course in practical politics, which has been completed by more than 100,000 persons in 1,300 communities during the past year and a half.

"All that is needed is the willingness to take on citizenship responsibility. Wherever the action course graduates have made a concerted political effort, they have had spectacular success."

As examples of action, he mentioned Carlsbad, N. M., where 75 graduates of the political action course worked the precincts systematically and, in the face of strong opposition, swept into office a full slate of candidates consisting of a mayor, four councilmen, a state senator, two state representatives and a county commissioner.

In St. Paul, he said, more than 400 graduates teamed up. The result: a new mayor and four councilmen were elected in a startling upset.

"A well organized 'Committee of 50' young business and professional men put on a campaign that elected a mayor and changed the complexion of the local administration in Saginaw, Mich.," Mr. Motley said.

The same kind of results can be achieved anywhere, he added.

"Those of us who are involved with the Chamber's program are no longer surprised by a success story from some new community. We are only surprised that the same thing isn't happening in a lot more places."

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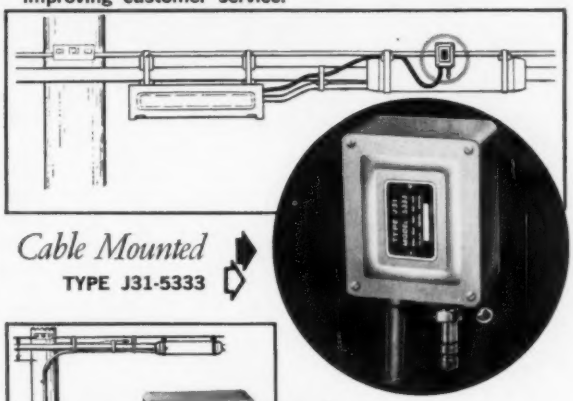
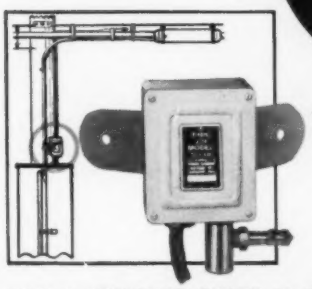


Cable Mounted
TYPE J31-5333



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- The Pressure Guard transmits its signals via working subscriber lines rather than requiring special circuits.
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- The Pressure Guard's low cost permits liberal usage for maximum protection.

SPECIFICATIONS

TYPE J31-5333

Field Adjustment Range ..... 0 to 10 PSI
Factory Setting ..... 2 ±¼ PSI on falling pressure
Pressure Response ..... 4 ±½ oz.
Proof Pressure ..... 30 PSI
Electric Rating ..... 0.01 amp 100 V DC
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270,000 OHM 1 watt
Drop Wire ..... 6' Type SJO#18 stranded 2.0 conductor
Pressure connection: ⅛ NPT (⅛ x ⅛ elbow provided separately; usually not required with direct sleeve mounting).

TYPE J31-5338

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Courts and Commissions

Criticize Intervention in Carolina T&T Rate Case

The intervention of the North Carolina attorney general's office in a rate adjustment case of the Carolina Telephone & Telegraph Co., of Tarboro, was criticized by a member of the North Carolina Utilities Commission at a hearing on Oct. 7 (TELEPHONY, Sept. 24).

Assistant Attorney General Kent Burns argued before the commission that it should reject the proposed rate adjustments, contending that the proposals, which include a plan for automatic regrouping of exchanges as they grow in population, should be considered only in a general rate case.

Commissioner Sam Q. Worthington asked Burns how many people asked the attorney general to intervene in this case, and Burns replied "None, sir. People do not know how they are being taken advantage of in such cases. That is why the statutes give the attorney general the power to intervene."

Worthington replied, "I believe North Carolina enjoys as advantageous telephone service as any state in the nation. It does seem harsh that a company, trying to improve service for a great many people should be told it cannot put the improvement into effect without a long delay."

He said that following the procedure for a general rate case would mean it would be at least two years before the company could put its proposals into effect.

CT&T's proposals would allow an exchange to move automatically up from one group to another without an action before the utilities commission, but Burns argued that such regrouping is "nothing but another device for raising rates." He said the company has estimated its adjustments would mean increases to some subscribers and reductions to others, which would about offset each other; but, Burns added, "We don't know what it might mean in the future."

Increase for Ark. Company Granted in '59 Permanent

The Arkansas Public Service Commission on Oct. 7 made permanent the rate increase granted on Dec. 21, 1959 to the E. Ritter Telephone Co., Marked Tree (TELEPHONY, Jan. 9, 1960.)

The rates, affecting the exchanges of Marked Tree, Lepanto, Keiser, Tyronza, and Midway, had been put into effect temporarily in the face of protests by Tyronza and Lepanto.

The increase granted the company was designed to yield additional income of $30,475 annually.

Order Investigation of Bell Rates in Pennsylvania

A full-scale investigation of Bell Telephone Co. of Pa. rates has been ordered by the Pennsylvania Public Utility Commission to determine whether the company is earning more than a fair return (TELEPHONY, Sept. 17).

The commission's action came after the company in a letter to the agency refused to make a voluntary cut in rates on the ground that its current earnings were not excessive, as contended by the commission.

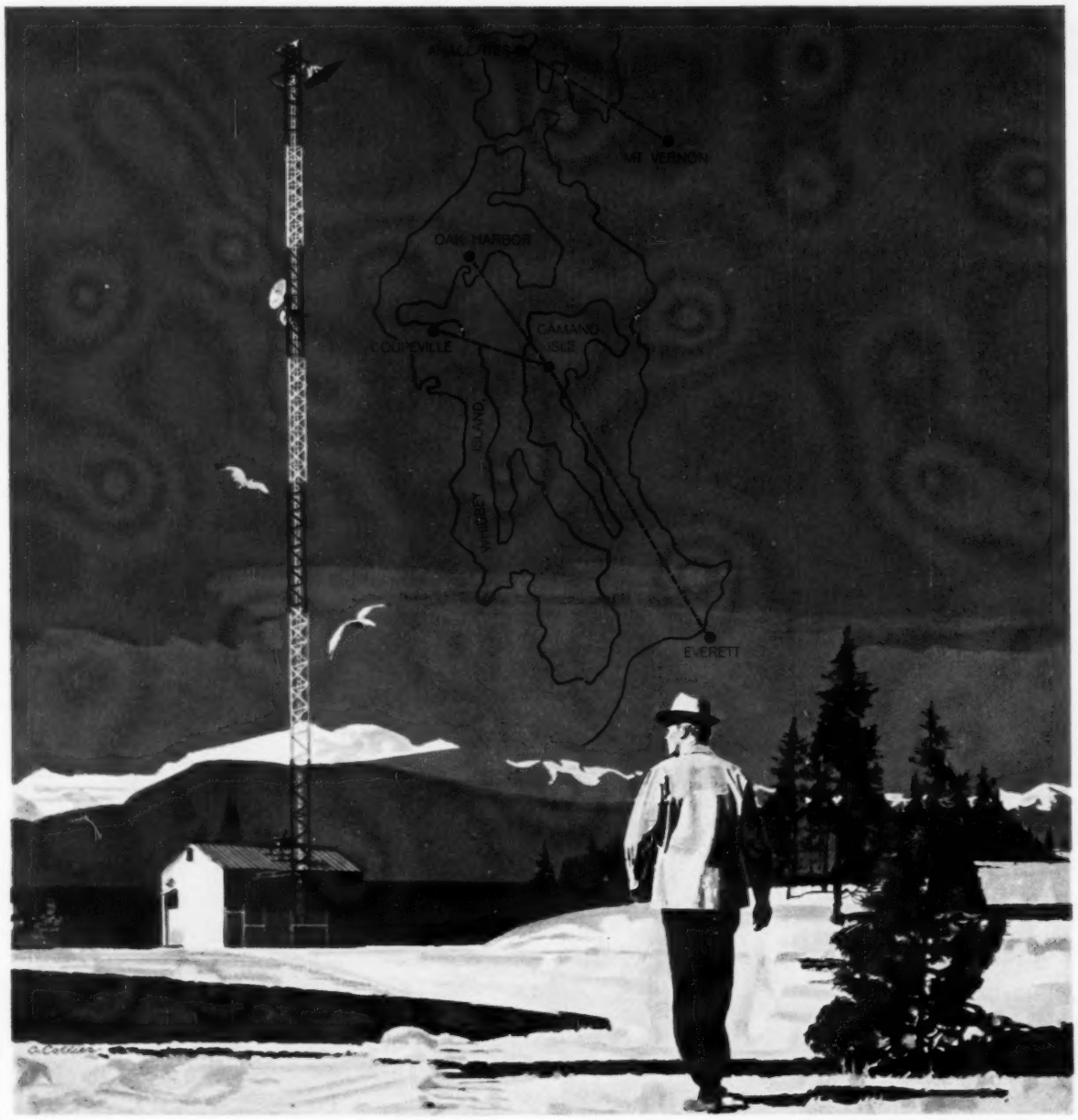
W. D. Gillen, president of the company, said Bell could not agree to voluntary reductions in rates. He said the company would demonstrate why telephone rates should not be reduced. "Complete data supporting the company's stand will be supplied at the proper time and place in accordance with established practice in handling matters of this kind," Mr. Gillen said.

Commission staff members said it appeared on the basis of the telephone company's quarterly reports that it may be earning an estimated 3 million dollars more than the fair return of 5.9 per cent fixed by the commission in 1956.

The investigation order by the commission is the first of its kind involving the telephone company. Pennsylvania Bell Telephone serves 2,577,000 subscribers in the state.

The commission early in September gave the telephone company 30 days to submit "specific proposals" for a voluntary rate reduction or be subjected to formal public hearings. With the company's refusal, the commission said hearings would begin "as soon as possible," probably in Harrisburg.

Mr. Gillen, in a letter to Leon Schwartz, chairman of the commission, said that any sound appraisal of the company's situation should await the availability of a full year's results for 1960, in view of current and prospective economic conditions; wage in-



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to link Puget Sound island communities with mainland . . .

This frequency diversity system provides 56 channels for service to communities on Camano and Whidbey Islands out of a terminal at Everett, Washington. Included are more than 25 miles of overwater spans. Another Collins system installed for this company more than 3 years ago provides service between Anacortes and Mount Vernon. For information on a microwave system custom-tailored to your own needs, contact Collins Radio Company, Texas Division Sales, 1930 Hi-Line Drive, Dallas 7, Texas.

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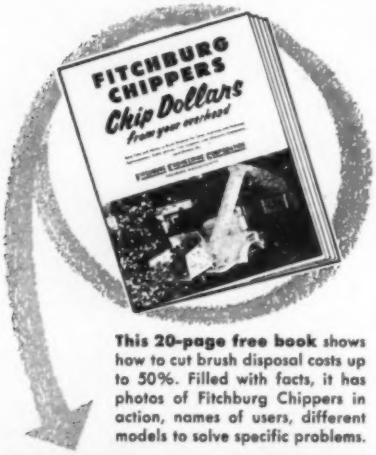

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creases, negotiated and in prospect, and other factors.

His letter also noted that the commission had not indicated the extent to which it considers Pennsylvania Bell's earnings excessive, nor the value of the company's intrastate property, or rate of return which the commission used in forming its opinion as to what it considers the proper level of earnings for the company.

The Bell company executive also raised several issues, such as "increased cost of operation and the economic situation," to justify his claim that the telephone company's rates were not too high.

The commission contended that the utility was earning an excessive return on intrastate operations, based on data for the fiscal year ended last March. It then asked the company to fix lower charges on local exchanges "in such amounts as to reflect earnings not to exceed a fair return on a fair value of the company's property, used and useful."

No specific rate reductions were proposed by the commission, on the ground that subsequent financial reports could change the rate picture. The commission, in requesting the voluntary rate cut, said "failure on the part of the company to act affirmatively . . . will result in the institution of formal proceedings by the commission."

Required under a new procedure started this year, studies of the telephone company's quarterly reports indicate that it might be earning 6.2 per cent on fair value, according to the commission. The Pennsylvania Superior Court, which hears appeals from orders of the commission, traditionally has held that 6 per cent is a fair rate of return. However, there is no actual ceiling.

Mr. Gillen said construction costs have increased since 1956, when the commission ordered a 5.9 per cent rate of return; "as have wages and the cost of borrowed money. Proper reflection of these factors would reduce the rate of return. . . . The Bell Company has achieved its current earnings rate in spite of higher wage rates and higher costs all along the line. At the same time, we have made substantial service improvements of which we are quite proud, and over the last 20 years, our rates for local service have risen less than a third as much as the cost of living."

He added that this record was due to aggressive marketing of such optional services as extensions and color telephones, to increased employe efficiency, and to extension of automation to keep pace with the state's communications requirements.

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Neb. Company Granted Dial Rates for 6.4% Return

The Home Telephone Co. of Nebraska, Inc., Brady, was authorized on Oct. 5 by the Nebraska Railway Commission to increase rates and charges at its Maxwell exchange (TELEPHONY, Oct. 8).

After conversion to dial operation on or about Nov. 30, the rate base will be $160,195.96. This is based on original book cost, plus material and supplies, and cash working capital less depreciation reserve. New rates are estimated to produce a rate of return of 6.4 per cent.

The company serves 405 subscribers at Brady and Maxwell. It proposes to obtain $50,000 from the Stromberg-Carlson Co. to finance the conversion program.

New rates will become effective as follows, with conversion of this exchange to dial operation:

One-party business	$ 7.75
Rural business	6.75
One-party residence	5.00
Two-party residence	4.50
Rural residence	5.00
Switching subscriber (minimum of 5 per line)	1.50
Semi-public (guarantee)	7.75
Automatic fire alarm	15.00

The commission also approved a rate of 10 cents per local call from pay-stations and a $7.50 installation charge for color telephones.

PUC Asks New England T&T To Reduce Toll Rates in N. H.

The New Hampshire Public Utilities Commission has called upon New England Telephone & Telegraph Co. to prepare plans to reduce toll rates in the state to compensate for excess earnings the company is said to have realized under existing rates.

The commission specifically suggested that the company reduce its intrastate toll rates to the "same level as interstate toll rates for comparable distances."

Commission Chairman Harold K. Davison said the three members of the agency had conferred with telephone company officials, and another conference had been scheduled for Dec. 15. At that session, he said, the company presumably, will produce figures to show what effects the proposed reductions would have on its gross revenues.

Mr. Davison said that if the commission's suggestion is carried out, it would lighten the burden of toll calls made within the state, which are now substantially higher than toll call rates

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from stations inside the state to those outside New Hampshire.

The commission, in an earlier letter to William C. Mercer, New Hampshire general manager of the company, said:

"A continuing study by the commission and its staff, of field financial reports of the New England Telephone & Telegraph Co. indicates that for several months, the company earnings have exceeded the rate of return allowed.

"It appears for the year ending July 31, 1960, the company's New Hampshire intrastate net earnings exceeded a proper rate of return by at least $210,000, or more than $440,000, before federal income tax and the American Telephone & Telegraph license expense.

"The commission, accordingly, directs that authorized officials of the company meet with the commission at a conference . . . to discuss plans to reduce rates by this amount, or whatever amount the commission may approve.

"The commission specifically directs that at the conference, the company report the effect on gross revenues, if intrastate toll rates were to be reduced to the same level as interstate toll rates for comparable distances."

Letters had been sent by the commission to the company at the end of the 1958 and 1959 fiscal years declaring that the company's net earnings were in excess of the 6.2 per cent rate of return set by the commission, and directing that earnings in excess of this rate should be set aside in a special reserve account for the "benefit of telephone ratepayers in a manner to be later determined" and not transferred into the company's surplus account.

Sale Hearing Set in Illinois

The Illinois Commerce Commission on Oct. 20 was to have heard the petition of Batchtown Telephone Co., Brussels, to sell its property to Fieldon Telephone Co. The Fieldon company has also asked for a certificate of convenience and necessity to serve Batchtown's territory.

Va. Company Sells Bonds

The Clifton Forge-Waynesboro Telephone Co., Staunton, Va., has sold $500,000 of 25-year bonds to the Mutual Benefit Life Insurance Co. of Newark, N. J., it was reported on Oct. 1. The company, which serves Clifton Forge, Covington, Potts Creek and Waynesboro, will use these funds to provide additions to its property.

Octogenarian Wisdom

"Those who retire without some occupation spend their time talking about their ills and their pills."—HERBERT HOOVER, *on celebrating his 85th birthday.*

Council Issues Safe Driver Booklets for Winter Season

Released in time to permit pre-winter car and motor conditioning, and giving results of actual driving tests during the harshest mid-winter conditions, are two new booklets issued by the National Safety Council.

"Keep Rolling with Safety in Winter Weather" is the booklet aimed at the driver of trucks, buses and commercial vehicles. It outlines the six major hazards of winter driving, including increased braking distances and the effect of temperature on starting and stopping.

Test facts on jackknifing and its prevention, as well as maintaining control in skids, are explained in detail. Use of tire chains is discussed—and strongly urged.

For passenger car drivers, the other booklet, "Be a Winter Winner" offers in nontechnical terms tips on safe winter driving. Research-obtained information relates the best methods of starting, stopping and maintaining traction while traveling through snow and ice. Again, tire-chain use is emphasized.

An 11-point checklist of essentials for preparing vehicles for the perilous winter driving season is included in both booklets. Both contain charts and drawings—and clear up a number of common misunderstandings about cold weather driving.

Research for the booklets was gathered by the National Safety Council committee on winter driving hazards. Top engineers and research people from governmental agencies and all branches of the automotive industry, equipped with sensitive electronic testing equipment, have tested all types of autos and commercial vehicles on frozen lakes in upper Wisconsin during the dead of winter.

The winter driving tests were begun in 1939 and have yielded much important information for automotive manufacturers, engineers, driver trainers and individual drivers. These tests are held each year.

A single sample copy of both booklets may be obtained from the National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill. For further information or quantity prices, write or contact the Council.

Promises and Deceit

"Liberal of cruelty are those who pamper with promises; promisers destroy while they deceive, and the hope they raise is dearly purchased by the dependence that is sequent to disappointment."—ZIMMERMAN.

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WILL YOUR ONE VOTE be important? Look at the record and answer that question yourself:

—In 1954, Averell Harriman was elected governor of New York by an average margin of less than one vote per election district.

—Abraham A. Ribicoff in the same year walked into the governor's mansion in Connecticut after he had defeated his opponent by only 3,115 votes out of one million cast.

—In 1948, Lyndon Johnson squeezed into the U. S. Senate when he edged out his competitor by only 87 votes—out of 1¼ million cast in the entire state of Texas.

—In 1956, Campbell Stevens nosed out George Rairden for nomination to the U. S. House of Representatives by just *two* votes.

—The mayor of the fourth largest city in Minnesota won a 1955 election by a *single* vote.

The power of a small number of votes also has been demonstrated in presidential elections.

—In 1952, President Eisenhower received the entire electoral vote of four states—Illinois, Mississippi, Rhode Island and Tennessee—in which the difference between his votes and Stevenson's was less than 10 per cent of their combined votes.

—Similarly, Stevenson took Kentucky and South Carolina by 10 per cent of the total vote.

In each of these six states, if no more than five persons in a hundred had voted the other way, the state would have gone the other way.

Does your vote count? You can bet your life it does. So be sure to cast it —after studying the men and the issues —next Nov. 8.

Plan $2.4 Million System of Communications in Venezuela

An 8-million-bolivar (2.4-million-dollar) communications system for eastern Venezuela will be completed by June, 1961, according to Dr. Luis Pena Vasquez, Telecommunications Director of the Venezuelean Communications Ministry.

Dr. Pena stated that the system will include telephone, telegraph and radio networks.

The telephone network's 72 trunk lines for simultaneous connections (provision is being made for an eventual 144 trunk lines) will serve the following cities, it was reported.

Puerto la Cruz; El Tigre and Anaco in Anzoategui State; Valle de la Pascua in Guarico; Maturin in Monagas; Ciudad Bolivar and Puerto Ordaz in Bolivar State; and Caracas.

Book Reviews

ELECTRICAL NOISE, *by W. R. Bennett*; 288 pages; 6x9; 106 illustrations; $10.00.

How noise originates in electrical circuits, the terms in which it is described, how it is measured, and how circuits may be designed to minimize undesirable effects from noise are presented in this newly published book.

It describes in qualitative and quantitative terms the physical nature of various important noise sources, including thermal agitation or resistance noise, shot noise in vacuum tubes and semiconductor junctions, noise from spontaneous emission of electromagnetic radiation, and noise in gas discharges. Fundamentals needed for analyzing

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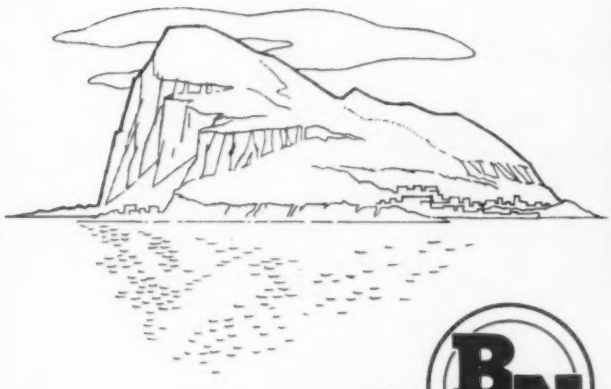

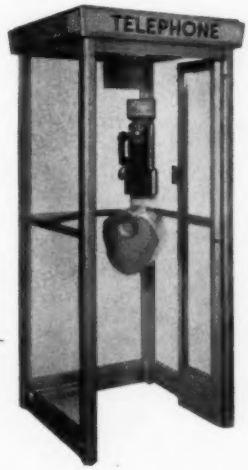

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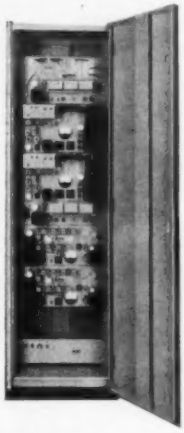

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basic sources of noise are covered, and methods of measurement and design are stressed. A discussion of the relation of signal and noise in communication systems of various types is included.

Coverage of recent advances includes a treatment of noise in transistors, masers, and parametric amplifiers. Among the subjects of special interest are the properties of thermal noise and its relation to black body radiation, and an introduction to elementary mechanics which is woven into the discussion of the maser and of noise in semiconductors. Fundamental facts about such devices as junction diodes, transistors, gas discharge tubes, klystrons, traveling wave amplifiers, and nonlinear reactive amplifiers are given as an adjunct to their noise properties.

In addition to the standard theory of noise figure and its significance, a treatment is given of the more comprehensive Haus-Adler theory of noise measure.

The book also presents a comprehensive review of noise in the various methods of signal transmission such as amplitude modulation, frequency modulation, and the different kinds of pulse modulation.

W. R. Bennett, the author, has served on the technical staff of Bell Telephone Laboratories since 1925, and presently holds the title of data communications consultant. His long career in transmission research has included pioneer contributions to methods of analyzing and controlling noise. He has had many papers published in technical journals on important problems in signal transmission.

•

"VITALITY IN A BUSINESS ENTERPRISE," *by Frederick R. Kappel*; 102 pages; 5½ x 8¼; $4.00.

This book is based on the McKinsey Foundation Lectures delivered during 1960 at the Graduate School of Business of Columbia University by Mr. Kappel, president of the American Telephone & Telegraph Co.

In his discussion, Mr. Kappel sets forth practical principles of managing a business successfully for the long run. He pinpoints forces of decay that can undermine a currently successful business enterprise and suggests how to deal with them.

Exploring the concept of business vitality, Mr. Kappel points out that excellence of personal performance is essential.

The book tells why management must set goals that stimulate people to strive beyond the level of present abilities. How to nourish this vitality and how

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to create a strong, creative, responsive organization is discussed.

Kappel feels that a deep feeling of ethical responsibility must be promoted. To do this, jobs that tax ingenuity from the beginning should be assigned; responsibility properly delegated; training both formal and on the job provided, and a man's ability and interests should be matched with his duties, Mr. Kappel states in his formulation of the concept of business vitality.

This book is available from TELEPHONY.

Western Electric Announces Personnel, PR Changes

Robert D. Lilley, personnel director of the Western Electric Co., has been elected a vice president, effective Nov. 1, the company announced on Sept. 29. He will succeed Arthur P. Clow as vice president of personnel and public relations.

Mr. Clow has resigned from the company, effective Oct. 31, to become vice president and general manager of the Chesapeake & Potomac Telephone Co., operating in the District of Columbia.

In several related changes also announced at the same time, Charles R. Bergmann, of Westfield, N. J., currently personnel manager of Western Electric's distribution organization, was named company personnel director to succeed Mr. Lilley.

Harlow D. Dodge, manager of the company's Atlanta distribution center, becomes personnel relations manager in the distribution organization, replacing Mr. Bergmann.

Italian Microwave Producer Joins GT&E Intl. Group

General Telephone & Electronics International Inc., international subsidiary of General Telephone & Electronics Corp., has acquired a majority interest in the Radio Communications Division of Magnetti Marelli, Milan, Italy, according to an announcement on Oct. 11 by Donald C. Power, chairman and chief executive officer of GT&E.

Mr. Power said that a new company has been formed, known as Marelli Lenkurt. S.p.A., located in Milan. The new company will specialize in the manufacture of Marelli microwave radio and carrier apparatus, Lenkurt carrier and transmission equipment, and Automatic Electric S.A.T.A.P. (Milan) carrier and radio equipment, which division of the latter is being merged with Marelli Lenkurt.

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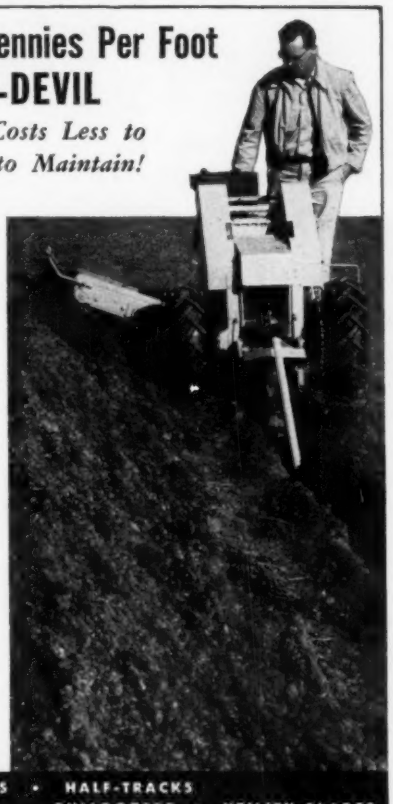

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GT&E chairman said: "This new company brings together in the international field three of the world's leading manufacturers of radio transmission equipment. The teaming together of these enterprises will make possible a broad expansion of production in each country."

Pointing out that American investment abroad is increasing steadily, Mr. Power commented: "The growth possibilities in communications and electronics are particularly promising. These two fields have the greatest potentials of any major industries because they will provide the indispensable tools for large-scale economic growth and development."

Name Three to Export Sales Posts at AE International

Three new assignments in the export sales department of Automatic Electric International, Inc., Northlake, Ill., have been announced by H. C. Jones, vice president and sales manager.

N. W. PRICE

Nelson W. Price, formerly district manager for the eastern hemisphere, will transfer to Bogota, Colombia to replace J. P. Maclaren, vice president and general manager of Automatic Electric de Colombia, S. A.

Frank W. Krescanko, formerly sales liaison manager of AE International's foreign manufacturing affiliates, becomes district manager for the Far East. He will also continue with sales liaison activities.

Bernard K. Papierski takes over the remainder of Mr. Price's territory as well as liaison with European manufacturing affiliates and becomes sales coordinator for Europe, the Middle East and Africa. He formerly served as assistant to the district manager for the eastern hemisphere.

F. W. KRESCANKO

Mr. Price joined Automatic Electric International in 1957. He was named assistant to the vice president and sales manager in January, 1958 and was promoted to his former position in December 1958.

He was born in Belgrade, Jugoslavia, raised in Belgium and educated in Europe and the United States. After receiving a B. S. degree in political science from Northwestern University, he attended the Foreign Service In-

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stitute of the Department of State in Washington, D. C. He also did graduate work at George Washington University.

Prior to joining AE, Mr. Price was with the Foreign Service of the Department of State, where he served as vice consul and assistant political officer at the U. S. Embassy in Addis Ababa, Ethiopia.

B. K. PAPIERSKI

Mr. Krescanko joined the AE organization in 1957 as an administrative assistant and was named sales liaison manager in 1958. He received a B. S. degree in economics from the University of Wisconsin and a bachelor of foreign trade degree from the American Institute of Foreign Trade at Phoenix, Ariz.

Mr. Papierski went to Automatic Electric International in 1957 as assistant supervisor of order service and successively served as supervisor of order service and assistant to the district manager.

He received a B. A. degree in speech from Coe College, Cedar Rapids, Ia. and a certificate of Spanish studies from the University of Madrid.

Automatic Electric International, Inc., is the export sales and distribution affiliate of all the telecommunications manufacturing affiliates of General Telephone & Electronics Corp.

Robert Deal Is Kearney General Sales Manager

The James R. Kearney Corp., St. Louis, Mo., has announced the appointment of Robert E. Deal as general sales manager. Mr. Deal was formerly manager of marketing with the 3E Co., which has recently been acquired by Kearney.

In his new position, Mr. Deal will be

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responsible for co-ordinating sales of the 3E line of switchgear and apparatus and the Kearney line of electrical utility equipment.

He is an electrical engineering graduate of the University of Tennessee. His background in the electrical apparatus field includes 5 years with Line Materials Industries and 6 years with the Duke Power Co. of Charlotte, N. C.

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L. M. Berry & Co. Announces Three Management Changes

Three more appointments were announced by L. M. Berry & Co. in a series of recent management changes. R. H. Eshelman was promoted to general sales supervisor, R. T. Davis was appointed New York division manager, and H. Lamarche was named Pennsylvania division manager.

R. H. ESHELMAN

Mr. Eshelman joined the company as an Ohio division salesman in August 1947. He was transferred to the Louisiana division in 1948, and was appointed district manager of north Louisiana in February 1951. In August 1952, he was

R. T. DAVIS

named district manager of south Louisiana, and was made New Orleans district manager in July 1954. In December 1954, he was promoted to Louisiana division manager and held that post until his recent appointment.

Mr. Davis joined the company as a salesman in Milwaukee in August 1948,

H. LAMARCHE

and carried out sales and supervisory assignments throughout the company until December 1950, when he was appointed district manager in Tennessee. In September 1954, he was named Pennsylvania division manager, and served in that capacity until his new appointment.

Mr. Lamarche joined the firm as a Pennsylvania division salesman in December 1951. He became a supervisor in that division in September 1956, and was named directory supervisor in December 1957. In May 1959, he was appointed district sales manager in the mid-eastern division, and held that position until his recent appointment.

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33 years old, Lew is a veteran of two wars. From 1943 to 1946 he served in the U. S. Navy as an aviation gunner in the South Pacific. In 1950, he returned to the Navy to serve during the Korean crisis.

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Lew and his wife Wilma have three lovely daughters: Sandra Kay, 12; Darci De, 5; and Dani Jo, 3. Surrounded by women at home, Lew's outside activities include membership in such "men only" groups as BPOE, VFW and the American Legion.

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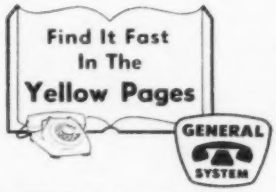

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